

# MOTOR AGE

Vol. V No. 3

JANUARY 21, 1904

Ten Cents



THE WINTON MOTOR CARRIAGE COMPANY

Members Association Licensed Automobile Manufacturers,  
FACTORY AND GENERAL OFFICES

CLEVELAND, OHIO, U. S. A.

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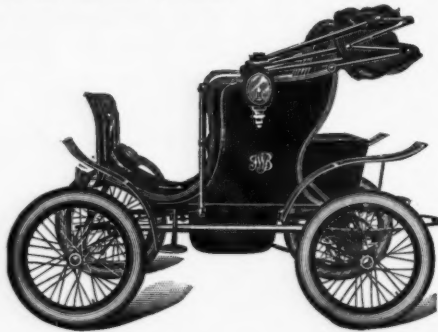
Philadelphia

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New York Show, Spaces 90-92.

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MOST ECONOMICAL  
TO KEEP

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NEW YORK SPACES, 61-62-63 Madison Square Garden

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**WATERLESS  
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**CARS**

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known value and the most valuable known. They are  
brilliant as diamonds in service and always at par,  
easy to operate, and wear like diamonds. Examine the  
Knox patent air-cooling system. The only high power  
engine cooled by air. The ideal winter machine. You  
can save repairs by using the Knox. They have  
every tested modern improvement.

**TONNEAUS, SURREYS, and RUNABOUTS**

Six Styles Passenger Cars and Six Styles Commercial Cars to Choose From

Send for Catalogue  
Knox Automobile Company, Springfield, Mass.

Master Artisans of Latest Automobile Manufacturers

♦  
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# MOTOR AGE

VOL. V. NO. 3.

JANUARY 21, 1904.

\$2.00 Per Year.

## MADISON SQUARE GARDEN AGAIN THE MECCA



# FOURTH ANNUAL NEW YORK SHOW

International in Scope—Brilliant in Character of Displays—Gratifying Demonstration of Industrial Progress

New York, Jan. 17—The show is on. Greater and grander, more gorgeous and comprehensive, attracting increased crowds and altogether as near to being commensurate in magnitude of display with that of the industry itself as the cramped boundaries of the arena within, balconies above, restaurant without and basement beneath will permit.

The automobile show has outgrown Madison Square garden, vast building that it is and wonderful in size considering its location in the heart of the city's most crowded center. New York has no Palais de l'Industrie, which at the close of the Franco-German war housed the exhibits of the world, for her show; no more than has Chicago now the great Coliseum of the '90s, in which a quarter-mile racing track was once laid with ample room outside for box seats and several galleries for 10,000 spectators.

The growth of the industry made demands on Manhattan's amphitheatre that could not be met. Exhibitors have been crowded into space far incommensurate with their needs and demands—in some instances into but half the area granted them last year. The pressure has forced the display upward. There is a sense of height as one enters the arena and views the encircling promenaders moving aloft in the gallery. But one balcony remains to be added for the sundries and parts people, as it will certainly have to be next year at the present rate of the demand's growth, and then the all around limit will have been reached.

This is the way the problem has been solved this year: The arena is devoted to the heavy vehicles. A so-called "platform" to jolly its tenants into the idea that they are on the floor has been built above the boxes. To this the lighter cars have been consigned. The sundries and parts people have been put in the gallery above the arena seats, the latter, it will be remembered, being above and behind the boxes. The restaurant has been turned into a veritable "salon d'automobile," as the Parisians are wont to dub their show, where most of the importers hold forth. Down in the basement, dignified by the title "exhibition hall," is an overflow aggregation of cars of domestic and European vintage and considerable heavy machinery. Would-be exhibitors at any inconvenience have even seized with gratitude upon the little second tier boxes.

In measuring the magnitude automobile manufacture in this country has attained it must not be forgotten that had applicants been granted all the space asked

they would have filled the Garden twice over and that fully fifty would-be exhibitors, as it is, had to be refused space altogether. Big makers could not show one-quarter of their models and a majority less than half of them. Not a few have been forced to the expedient of changing their exhibit daily to get all their models on view at some time during the week. With all this the makeshift pressing into service of the "platform" over the gallery has been done with convenience to the spectators.

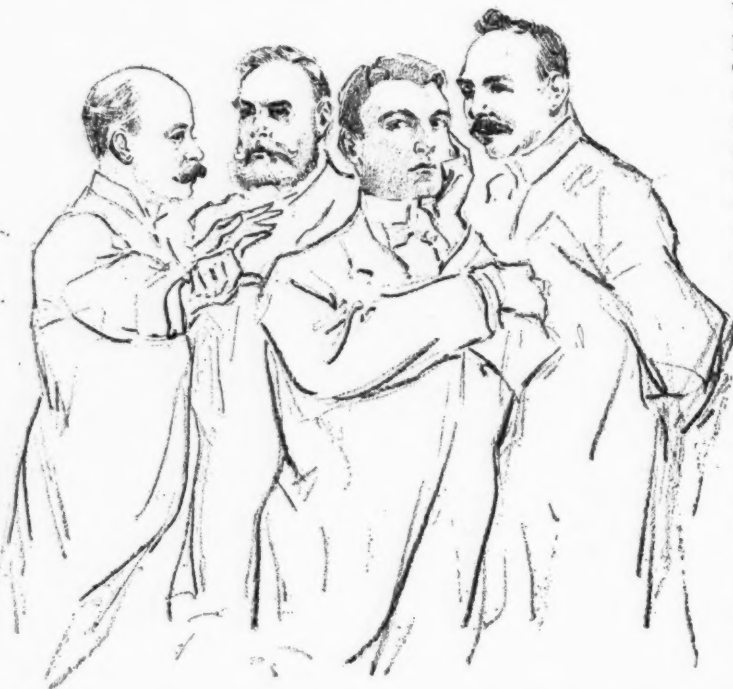
In rough numbers, pretty accurate, though, through there being no room for late comers, rough because there has been some splitting up of the spaces, there are 185 exhibitors. Ninety-show complete vehicles. Fifteen of them are importers, representing twelve European makers, as follows: F. I. A. T. Rochet-Schneider, Mercedes, Clement, Panhard, Mors, Renault, Darracq, Peugeot, Decauville, De Dion and Georges Richard-Brazier.

So much for the exhibits and their housing. The garden itself is the same old garden, of whose size, location and magnificence New Yorkers are so proud. The great chandelier blazes above, the embowering arches make a great arbor of light of the amphitheatre, and clusters of bunched bulbs flash from the posts. The decorators, however, have insisted on intruding and honor the function with hangings of lemon and white, clusters of flags and festoons of the national colors, pinned at frequent intervals with the emblem of the Automobile Club of America, the original promoter of the show and still a participant in the gate receipts through a three years' contract made at a nascent period of the

industry when the sanction of clubland was deemed necessary to a show's success.

In keeping with the decorations above and around were those of the stands themselves—electric signs, high art railings and posts, soft carpets, rich hangings, ornate furniture and pots of flowers, distributed with greater or less elaboration in different instances, but altogether a fitting setting for the most beautiful things of all in the building, the vehicles themselves with their gleaming metal, flashing varnish, well contrasted colors, plate glass limousines and luxurious upholstery. No more of average effect, however, had been made in embellishment of surroundings than in former years. Elaboration of adornment, unlike at the Paris show in the vast Palais de l'Industrie, had to be sacrificed to space restrictions and elbow room for the visitors.

Even to the laity the advance the home industry





had scored during 1903 was impressingly manifest. One could walk from the salon d'automobile, where are the best and finest caparisoned cars the factories of Germany and France can turn out and compare elsewhere European automobiles side by side with the American vehicles and not feel ashamed. In the elegance of the bodies, the grace of the lines, the richness of the upholstery, the elaborateness of the fittings and the general impression of power and strength conveyed, there was but a toss-up for the choice between the domestic and the imported product. Americans had learned their lesson well. They strove to copy last year. They have succeeded in this and in some particulars have improved upon their patterns. It is left to the technical critics to pass upon the merits of the machinery, the graceful running gear supports and the handsome bodies enveloped. Prices considered and compared leave the invaders to face a more difficult competition than ever.

It was in the light and middle weight classes, however, that the striking and commendable individualities of American inventors saved the national pride. Our makers are making their main play in the aggregate for this branch of the trade, which has less brass band advertising but is in a large majority in volume. In these classes ingenious Americanisms bristled all over the vehicles and Americanisms whose utility and cleverness were beyond dispute. It was really astonishing to see what our manufacturers had produced in the way of tonneau cars at prices but two or three hundred dollars above those asked for runabouts. The success of the invading Yankee skirmishers in Europe in runabouts seems more than likely to be repeated and to a greater degree in the low-priced tonneaus. There are big high-powered American cars on view too, it must be borne in mind, whose makers boldly and with seeming good reason put prices on them equal to their counterparts in power, size and finish among the imported vehicles.

Over in the salon d'automobile there was, despite all this, the same air of confident assurance in a superiority of product born of longer experience in the art and a satisfied belief that American buyers would continue to pay the difference in price brought about by the duty and founded on manufacture for the wealthy class and a continued demand up to the full output and a little ahead of it. The importers certainly showed a magnificent collection of cars that well deserved the unstinted encomiums showered upon them by experts and laymen. And why not? The best that Europe produces for

the land of easy spending millionaires, whose market it is so strenuously seeking, were to be seen there. The heavy swells of the "400" affected this section of the show. It had also many curious spectators among visitors from distant points, which the full wave of the foreign invasion has not yet reached. The importers had made every effort to secure the best and latest models, many of which were shown in this country for the first time, and there was a natural desire among American makers to examine them as well as the product of their home rivals. In the "salon" were to be seen not a few men prominent in the trade abroad, who in number more and more each succeeding year deem it necessary to visit the American shows.

In the great crowd in attendance, the magnificence of the entire display and the hurrah of the show itself optimism forgot conservatism and was fairly rampant. It was no place for men to weigh prospects soberly, and boom talk predominated. It was not to be wondered at

in the face of the great improvement in the middle and top price American cars and of the wonders those that sought to give much for the money had accomplished. "How can they help buying that car at the price?" was frequently heard and was the keynote of the boom chorus. All seemed to forget in the enthusiasm the great show brought, to fear the danger of increasing foreign competition at lower prices, the effect of a possible intimation of bad Wall Street conditions and the perils of a too sanguine overproduction that had been croaked over in factory offices and garages during the past three months of

the normal and to be expected dull season. This is not to be altogether lamented even by the conservative; for it fills makers and salesmen with energy and spreads infectiously to the public that is to do the buying. The public will surely get far better machines and a much better purchase for their money this year than last. This in itself would seem to justifiably point to a boom not altogether of show making.

Indications point to a record breaking attendance for a New York automobile show. The daily newspapers have given the exhibition such a booming as no garden function, except perhaps on the whole the horse show, has ever had. Yesterday and today they have devoted pages where last year they gave columns to it. Pictures galore embellish the columns of several of the dailies. The Mail and Express devoted four pages to an illustrated supplement showing the 1904 models and five pages besides to the story and the motor car adver-



"THERE IS NO EAST AND THERE IS NO WEST AT A SHOW."

tising. Among the other recognized special supporters of the automobile the Herald and the Commercial-Advertiser covered the show this morning and yesterday more than fully and with elaborate pictorial accompaniment, and the American took up the affair with characteristic hurrah and gave it three pages of illustrations and account, including the liberal advertising evidences of appreciation manifested by the makers, importers and dealers. In all this there is a lesson to the daily press of other cities in their treatment of the automobile. It pays. It will pay more. The enormous value of advertising the show thus received ensures unparalleled success.

The hotels are filled with show visitors. The early rush has been, of course, by the tradesmen, who have fallen in swarms upon the Cadillac, Navarre, Victoria and other Broadway caravansaries where the members of the industry most do congregate. All, however, report a marked rush of applications for rooms during the week. The latter come from the hundreds—no one knows how many—who take this chance to do their automobile shopping here and now or seek the opportunity the shows gives for the examination of all makes and the selection of purchases to be made from local agents on their return home.

As an educational affair the show is by long odds the most distinctive of all American automobile exhibits. It bravely asserts a progress in motor car construction which brings almost at hand the speculated time when American automobiles shall not only be better than European automobiles at the same price, but shall be undeniably the peerless cars of the world. At previous shows there has always been more or less of a subdued awe embroidering the exhibits of French cars. An atmosphere of aristocracy hung around them. This year, however, in the salon d'automobile a representative display of Europe's leaders is made. The machines are fine—in design, in construction, in finish, in appearance. They are away and above the French cars shown as curiosities, almost, in the Automobile Club of America's loan exhibit at the first show 3 years ago last November. The French trade has progressed rapidly. But in the other parts of Madison Square Garden are domestic cars fine in every particular—representatives in truth of the world's best class of automobiles. Automobile making is dividing into classes. The division by nations is ceasing to determine grade. "Wonderful," says the man who stands in the midst of the foreign car display at this show and compares the cars he sees with those he saw strewn about in the restaurant at that first show. "More wonderful," he says as later he sees

American cars in all the glory of modern design bearing the names he had seen on mere experiments at that same first show.

France has run a swift race. America has run a swifter one. Starting much behind we have drawn on; have caught on. The nations that were spread around the track of international competition have bunched. The last turn is soon to be reached—and then the sprint. The show viewed collectively and its cars separately and closely undoubtedly places America well in the running.

There is an elegance about the whole exhibition and an elegance about the cars shown which is convincing of the degree to which the American manufacturers have brought the products of their industry. We have in the past, when comparing American cars with other cars urged the fact that American cars are built for American roads and the awful abuses of cars necessitated by the use of these roads. Last fall twenty-five American cars ran

through a flood-swept country, sweeping on and on, past stalled trains and interrupted travel of all kinds. They proved that American cars could go anywhere, do anything that is ever required of an automobile. The garden show goes further in the demonstration. Here are the same stout, reliable, hardy cars that have made such records of success in hard road work; and here they are with the body and equipment splendor of the French greyhound created primarily for skipping over level boulevards. We have built to go and now we are building to furnish the acme of comfort and style. In a measure the indus-



DURVEA BESTOWS UPON THOMAS THE "SIGN OF THE THREE."

try as depicted duplicates that of France—its keynote is neither the racing nor the extremely light small car but the moderate power car for all uses, capable of good speed in touring.

From basement to the topmost balcony of the garden the whole show is the best testimonial that could be rendered of the development of the industry—it speaks through the goods displayed and the eye needs no interpreter to catch the lesson.

Spectacular, brilliant, crowded with motor car beauty—a picture in itself—the show is yet full of commercial and mechanical interest. It is not one sided; not a show for any certain class. It is broad as the requirements of motor car buyers; deep as the critic wishes to delve in workshop method and result. It has value for buyer, curiosity seeker, tradesman, mechanic, more so than had the recent Paris show, for it shows a greater progress in a twelvemonth than did that show. It is typical, national, superb.

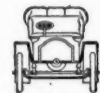


The car is much changed in appearance since Oldfield drove it its a bad evening for the show's opening, but it cleared away during the dinner hour and left a not so bad night of it after all. There had been the usual final rush of preparation and there was still a hustling in of exhibits and furniture when the sweepers essayed to begin sweeping around 6 o'clock. A crowd of fully a thousand was at the gates at half past seven o'clock. Some finishing touches were still being given the clean up and it was 8 o'clock, the announced hour of opening, before the doors were unbolted. The crowd swarmed in and soon filled the aisles and quickly fringed the booths. An hour later the garden was actually crowded. At the turns, stairways and congested points locomotion was difficult. Still the crowd grew and the police took a hand in directing its movement at the entrance and the stairways so that there should be no blockades. It was evident that a record breaking American automobile show crowd was in attendance.

At the opening hour the lights were turned on full. They jumped in a blaze from the arches and crawled quickly along the letters of the electric signs. The latter are far more general than before, and blazing above the platform booths and still higher up in the gallery, where they have never been before, gave a greater brilliancy than at previous shows.

The Pierce, Haynes-Apperson, Winton and Stearns stands formed a phalanx facing the entrance. The big booths of the Pope Motor Car Co. and the Electric Vehicle Co. flanked the main aisle in the center, with Autocar, White, Baker and Locomobile as their neighbors, Thomas and Cadillac stretched across the eastern end. The Vehicle Equipment Co. had the largest space of all for the display of its trucks.

There were really few attempts at elaborate decoration that went beyond the conventional or were worthy of special mention. The Pope company had again erected the elaborate outfit of electric lighted iron posts and signs, which were first used by it at Chicago. Up on the platform, though, the air-cooled Franklinites had built a gem of a drawing room in white, with an arched alcove and walls frescoed in flowers and tracery. The booth stood out by contrast with the somber hangings of its neighbors like a white temple in a thick grove. Along the platform several exhibitors made use of the steps and ample space behind for the convenient and not unornate alcove offices or tete-a-tete recesses.



Among the importers in the salon d'automobile there were several elaborate schemes of decoration more on the line of the Paris show exhibits. The Consolidated Motor Co., the new maker of the Moyea, a Franco-American concern, in its reproduction of the Rochet-Schneider, had a background of architectural work, frescoed in flowers. The Decauville people were conspicuous by Turkish cozy corners. The hangings and fittings of the Central Automobile Co. were also oriental.

Charley, the Mercedes outlaw, and Panhard & Levassor, the embargoed invader, held their ground boldly in the very fort of their enemies. Charley had only his cars and himself to show, but Panhard & Levassor put up a high art designed and befreescoed booth and had a party of fine wax ladies and gentlemen, attired in the very latest winter touring garb, in one of its cars.

How prominent the racing end of the game has become as a factor in advertising and the public's estimate of merit was seen by the conspicuous places those makers whose cars had won speed fame gave to the machines and the crowds that gathered around them.

With Barney Oldfield and Tom Cooper on hand and Bullet II, holder of all the world's track records, displayed by way of a text, the Winton stand was a Mecca for the racing fanciers. There the talk was race, race, race, record, record, record all the time. Barney and Tom were confident and defiant and ready to make any old matches with anybody and the new record makers in particular.

While there was less of racing talk at the stands of other record seeking firms there were the same curious crowds clustered around the mute speed heroes. The Stevens-Duryea light skeleton, which came within a fifth of a second of beating Vanderbilt's great Mors up Eagle Rock hill and later scored 57½ seconds for the mile at Ormond, a new world's record for its class, drew crowds. That the Packard Gray Wolf had covered a straightaway mile in 46½ seconds at Ormond, also a world's record in its class, was not forgotten. A bulletin prominently displayed the figures and the fact that in thirteen trials it had each time beaten the American straightaway figures.

Down in the recesses of the basement the MOTOR AGE man found Henry Ford and "999," Barney Oldfield's first love and the pioneer of the great American record breakers. Its new crown of the world's straightaway mile in 39½ on the ice at Lake St. Clair, made it the undisputed king of the royal speeders at the exhibition.



The car is much changed in appearance since Oldfield drove it its record mile on the Empire City track. A long pointed water tank, resembling a torpedo, tops the cylinders longitudinally. In front there is a big gasoline tank, pointed also to cut the wind. A wooden wind shield sloping toward the rear now protects the crouching driver at the wheel.

"We have to lessen wind resistance in every way possible," said Mr. Ford, as he gazed proudly at his space annihilator. "You know it takes 5 horsepower to drive a 2-foot square surface through the atmosphere at 60 miles an hour."

Mr. Ford pointed out the change in the gearing and stated that considering that 448 revolutions were equal to a mile a minute, it took double that number to secure 2 miles a minute, to which "999" very nearly approached that memorable day of its flight across the ice. Other changes, said he, have been the putting in of the Ford sparking device and the same carbureter used on the Ford commercial machines. He demonstrated how his daredevil mechanic lay alongside the cylinders on a board fastened to the frame and kept the throttle open and said that it required twenty trials or more of practice before a full speed mile was possible."

"Are you going to Florida with '999,' Mr. Ford?" was asked point blank.

"I think I shall," was the reply significantly given.

The Ford machine is not among the entries announced today. Record trials only are probably the ambition of the Ford fighter or perhaps only a try in case the beach flyers cut his ice figures.

A walk down the aisles discloses new things and novelties at every stand, tempting one to stop for a longer look than a mere casual glance. It would take many hours of inspection to catalogue all worthy of notice.

The Knox people have an aluminum finished chassis in operation, driven by an electric motor, showing the actual working of every part and rendering demonstration effective.

A gilded giant's hand hung from above points to the Haynes-Apperson three speed driving gear. Here may be seen one of the handsomest cars in the show—a royal purple body striped in white, with canopy top supported by brass uprights and fitted with an ornate brass luggage railing. One saw an impressive Quaker gray canopy top Columbia gasoline limousine at the Electric Vehicle stand and as diversified a display of electric town carriages as limited space permitted.



A striking limousine and a White touring car were noticeable at the White stand. The Locomobile people showed a brave array of gasoline vehicles—a touring car in gray with maroon upholstery and a handsome limousine.

The new 6-horsepower touring runabout with machinery beneath a hood in front was the surprise the Olds people had to spring. The new railroad inspection car rigged to run on the rails was also the object of much curious attention. At the Rambler stand attention was divided between the big 16-horsepower tonneau at \$1,350, which laid claims to being the most for the money offered at the show, and the delivery wagon convertible into a pleasure runabout or tonneau. There was naturally a crowd always at the Thomas stand listening to the gospel of the three-cylinder.

Racing interests naturally predominated at the Packard stand, where the Gray Wolf was starred as the feature. There was, as a matter of course, a strong desire to see what Col. Pope had turned out in his new products—the Hagerstown runabout and the Hartford tonneau.

So much for the result of the hastiest of hasty pushing through the big first night crowd for a mere peek at some of the stands.

The salon d'automobiles was so crowded with cars and packed with people in the limited space left for visitors that moving about was difficult and a close inspection of what the importers had to show still more so.

Toward the middle of the evening a sensation was created by the arrival at the Smith & Mabley booth of what A. D. Proctor Smith claimed to be the first French car to be built in America. It was made at the firm's factory in this city and has been baptized the Smith & Mabley Simplex. It has a racing body finished entirely in burnished aluminum with brass trimmings. The engine is the same as that which drove the Vingt-et-Un motor boat so marvelously fast on the Hudson.

The Decauville people showed a gorgeous tonneau. A beautifully furnished chassis attracted the most attention at the Darraec stand. Mr. La Roche was expecting tomorrow a park phaeton with footman's seat in the rear. The crowd in the importers' section





rendered it impossible to get near enough to the vehicles even to catalogue them, much less to point out the few features possible on a first night's rush through the show.

The limousines and the side entrance vehicles were, of course, the most interesting vehicles to be seen here. Side entrance was effected in some direct. In these cases the tonneaus were very roomy. In others the front seats swung on pivots and allowed ingress from beside the driver. A very roomy phaeton in addition to the seats placed against a solid back had small folding seats on each side door. There were also folding seats within some of the limousines. In one limousine coupé front entrance was gained by a sliding door. The space available for the importers is utterly inadequate and most of them will make daily changes of their exhibits.

Other importers had been crowded down into the basement. Notable among these were Alexander Fischer and the F. I. A. T. people. The former had a Rochet-Schneider chassis on view in the midst of rathskeller mural and pictorial surroundings. Mr. Fischer is to have this season a car built in France especially for him, yet unbaptized, though the MOTOR AGE man tried to force "Lafayette" on him as an appropriate name for a Frenchman who was to seek fame in America.

There are all sorts of interesting novelties in the sundry and fitting line to be seen in the gallery. It would have taken too long a time to burrow into the little nests on a first night to dig out anything in detail. Entire concerns are grouped about the "royal box" at the entrance and along the platform at that end of the garden. Red electric lights mark the abiding place of Grossman and the caoutchouc tubes at the rear end of the building, and Norris Mason has a brave display of Michelins down in the basement.

Some of the balcony eyries are made ingeniously conspicuous. The Federal Mfg. Co. has made a pagoda of its. Dick Wells, of the Badger Brass, and Governor Castle, of the 20th Century, let their lights shine

before men with their usual brilliancy, and this refers both to the visitors and to their lamps. The Rushmore searchlight is focused on a ground glass mirror and the power of the light is thus clearly demonstrated by burning paper, pencil heads and such in the focused beams. Dietz is conspicuous, too, among the path finders. Of course Charley Splittdorf's "spark" makes its usual long jump.

This morning's papers are loud in their praise of the show. The Sun, with its characteristic speak-right-out Americanism, with no qualifications or apologies, happily hits the nail on the head when its automobile writer, a critic of standing, says:

"Having started from 'scratch' about five years ago, allowing the mechanics in other nations of the world handicaps of from 1 to 4 years' prior start, the automobile industry of the United States has quite caught up. It has closed all intervening gaps and is now running with the 'leading bunch' on terms of even competition in the race for commercial supremacy. The fourth annual automobile show that opened in Madison Square garden last night leaves no doubt about this. The great exhibition building is almost packed with big and little motor vehicles that equal in up to date appearance, general style and finish, the best of the foreign made cars, and that the American machines are the equal in efficiency has been amply demonstrated. This fact of the American manufacturer having caught up with the leaders in the industry abroad is the most prominent, important and interesting one revealed by the fourth annual show. The American manufacturers are no longer at school in the college of the European industry—1903 was their senior year. The present show is their commencement exercise. They have learned the foreign methods and the ideas that inspire them. They are employing them to a considerable extent, but there are abundant signs that the American industry has entered upon an independent career, which will no longer be hampered by servile imitation."



## A FRENCHMAN'S IMPRESSION OF THE SHOW

Having been asked by the editor to give my opinion on the present show from a Frenchman's point of view, I endeavored in the short time allowed me, to get a general idea of the whole show, and after landing there Saturday afternoon among the workmen and the caretakers busy fixing the stands for 8 o'clock, I made a few observations that may interest the readers of MOTOR AGE.

I must admit that to one who is not well acquainted with the American makers the difference between the practice in automobile designs on both sides of the ocean would be simply amazing. If I only consider the typical American machines, the light and comparatively low priced runabout, for instance, of which the Oldsmobile can be considered as a typical model, I find that there is not a single feature common to this car and the French cars of the same price and power.

The almost universal use of the horizontal motor, even on high power cars, is most surprising to the French visitor, when it is considered that most European makers, except two or three extra-conservative concerns, have entirely rejected this type of motor, except for industrial vehicles of heavy duty.

Not less surprising to me than the great number of horizontal motors is the number of planetary change speed gears to be found on the cars up to 20 horsepower. This is also a feature practically unknown on the French market. The last Paris show did not have more than three of these gears shown on European machines, all of which were very poorly designed, and fitted on cars made by minor concerns of practically no importance.

It is my own belief that the planetary gears, although more appealing to the mind of technicians and inventors, will be, sooner or later, replaced by the sliding gear, unless a new planetary device, simpler and lighter, is found. I consider that a sliding gear, light and compact, such as the one used on the Covert runabout, which I was able to examine carefully, is much to be preferred to any kind of planetary gear. I was pleased to see that the sliding gear has already made a good many friends among the manufacturers and that it is to be found even on some of the lighter runabouts, which it certainly did make look simpler and neater.



The spur gear differential is used here to a much greater extent than abroad, and I consider this one of the points in which America will teach a lesson to Europe, together with the use of the tubular

By RENE M. PETARD



wheel, which is not manufactured to any great extent abroad. The French seem to be satisfied with the wooden artillery wheel, a standard equipment of their cars, and only endeavor to increase its strength and lightness without looking in any other direction. I was pleased with the tubular wheels shown either on cars or at the stands of the makers, and I believe that there will soon be a wide export market open to their manufacturers.

I think also that some of the American ball and roller bearings should find a ready sale abroad.

The lever steering seems to lose in favor and this is certainly not to be deprecated. The French makers are against such a steering device, and they are far from being wrong. It is evident that after a long ride on a rough road the hand and wrist of a driver will be much more tired and sore than with wheel steering. A good proof of this fact, and also of the fact that the demand for wheel steering is increasing, is the adoption of a wheel on the new Oldsmobile runabout.

Outside of the runabouts, and in some instances in the runabout class itself, European influence is plainly shown. As a rule the French and German conceptions have been cleverly applied and sometimes improved upon. The imitation is far from being as close as last year, and in a majority of cases the European ideas seem to have been simplified and, as far as ease of manufacture is concerned, improved in such a way that American manufacturers can boast of an originality which was not to be found last year. However, in most cases the parts do not show the same refinement and ingenuity in the design of details that is to be found in the European products.

Another total departure from European practice besides the ones above named, is the use of air-cooled motors on cars of considerable weight and power. The Americans seem to appreciate the advantages of these engines as far as simplicity is concerned, and after the success of air-cooled machines in the endurance runs, as well as in everyday use, I believe that this type has come to stay. However, I believe that it would be a mistake to increase too much the power of the engine and that a favorable location of the cylinders will be difficult to find without impairing the good looks of the car.

As a whole I consider the present show as a great success and an immense improvement on last year's. The manufacturers show better products, cheaper and better looking cars, and I believe that the day is close when Europe will fear American competition to an extent yet unknown and entirely unexpected by her.





# THE TREND OF AMERICAN CONSTRUCTION

It is freely expressed by the Americans at the New York show in Madison Square garden this week, that this is the last year of popularity of foreign cars in this country, the consensus of home opinion being that in many particulars cars made on this side of the Atlantic are fully equal to, and in some cases excel, the productions of abroad. The home trade is jubilant. It points to its own exhibit and declares that the comparison between it and the foreign display is not subject to any apology, explanation or excuse.

The importers and direct representatives of the foreign cars, on the other hand, point with justifiable pride to the interest taken in their wares and show numerous orders tending to disprove the theory that the public is losing its idea of the supremacy of European machines.

Whatever the truth of the situation may be, it is evident to all that there has been a decided advance in the production of American cars and that probably this advance is greater than the corresponding improvement in the foreign cars of this year over those of last. The improvement in all the cars, foreign and domestic, is most noticeable in their style, finish and equipment; but upon investigation it is found that it extends much further, including the general design and construction, the accessibility of working parts, the strength of supporting members of the machine, the selection of materials, the workmanship, the finish of mechanically operated parts and the handling of the minute details. American cars have especially advanced in the last particular and there is a noticeable lack of unfinished or crudely finished parts which have sometimes in the past characterized moderate priced and even comparatively high priced American machines. The fitting of a cotter pin has become the work of care; the determining of bolt lengths has been brought to an accurate mathematical basis, and file marks or the rough burr where a hack saw has cut off an unwanted quarter of an inch of bolt or screw, are not in evidence.

In the general selection of models the trade has run toward larger cars, and in the number of different makers producing them the small cars are far in the minority at the show. The runabouts are heavier, the light tonneau cars are heavier and the touring cars are heavier. It is impossible to tell whether this is one step in a continued process of development, or whether it be the first step of a high power fad, such as characterized the French industry a year ago, only to find itself beaten by the public demand for rigs more convenient and of more general utility than the high powered racers equipped with a few touring makeshifts.

Strength and durability have always characterized American productions and it is not to be wondered at that the American makers are endeavoring to put enough material into all cars of all models to render them capable of the most severe service under any possible conditions. It may be, then, that the tendency at this show toward larger cars means that the trade has reached a limit of substantiality and power and that succeeding years may not each denote the increase in size which has characterized each Madison Square show.

In the matter of preferences in the selection of accessory devices, it is noticeable that while the jump spark system of ignition naturally predominates, the make and break system has gained new advocates, especially in the case of foreign cars. One prominent manufacturer, in fact, gave it as his opinion that within a very few years the jump spark would be in the minority. At any rate several American makers who have previously used only the jump spark, now offer either system optionally to the customer, while others fit both to the machine.

In the construction of motors the mechanically operated inlet valve is much more in evidence than a year ago, but still the majority of the motors have the atmospherically operated inlet valve. In valves, also, there are more flat seated ones than formerly. Valve openings are larger and more attention has been paid to such small points in construction as the adoption of means to prevent valve stem spring fastenings from

becoming loose. One of the most ingenious arrangements toward this end is the obviation of the cotter pin by turning the valve spring end crosswise, so that it may extend through the hole usually fitted with the pin. The cotter pin or slot and key construction is almost unanimous, however.

Such conveniences as commutators in plain sight of the operator, motor governors, magnetos used in connection with storage batteries and force feed lubrication are becoming more common, especially on the larger cars.

In all but the light class the sliding gear predominates the transmission situation. This is used principally in connection with single or double chain drive, but there is a noticeable increase in propeller shaft

and bevel gear transmission since a year ago. It is surprising that in the sliding gear systems less than one-half of the makers have provided interlocking devices between the clutch and gear shifter.

Pressed steel frames are common, but one of the most popular frames is the built up frame made of plate steel and angle irons. The straight angle iron frame is, of course, predominant among smaller makers. Most of the foreign cars and a few of the American cars are equipped with pans underneath the motor and transmission cases.

The hexagon top, the square top and the oval top bonnet are almost universal. It is a great tribute, indeed, to the Mercedes car—this way in which American designers have racked their brains and strained their ingenuity in the endeavor to create Mercedes style bonnets which will be as pretty and as stylish as the Mercedes and yet different from it. An interesting photograph would be a front view of all the different square bonnets at the show. In connection with most of these bonnets some form of cellular or so-called honeycomb radiator is used, and this, of course, means almost without exception a direct drive fan behind it to form a forced draft.

In bodies the American builders have become more ambitious and more daring. All of the bodies are more roomy, more comfortable and more luxuriously upholstered, this tendency applying to small as well as to large cars. Canopy tops are common to almost the whole trade, while the limousine appears on machines whose makers previously built nothing more pretentious than the ordinary light tonneau. Front and side doors to tonneaus spot the exhibition and double tonneaus are not wanting. It is evident that the carriage making art is being worked to the limit to create bodies which will make vehicles more luxurious, more useful and more desirable in every way than horse drawn carriages of any kind have ever

been. Comfort in rough road work has evidently become one of the primary qualities of automobile design and construction. Wheel bases are longer; 6 feet now being short even for a pretentious runabout. Wheels are larger, tires are larger, springs are longer, wider and of more leaves. Bumpers are more in evidence and extremely great overhang on tonneaus is disappearing.

Returning to the first consideration, that of the relative values of American and foreign cars, it is unquestionably true that—whether or not next year sees the rapid decline in the importation of cars that marked the sunset of the bicycle importing business when the American cycle manufacturers reached a stage of development from which they could quickly spring into the lead—it will not be many seasons ere the salon d' automobile at the New York show, if there be one, will not be the standard of value by which the rest of the exhibition is compared, either favorably or unfavorably—the French car will not be the yard stick of automobile of excellence.

The show is a wonderful one and the automobiles shown are wonderful when one stops to think of the character of the cars of the show of 3 years ago. They are wonderful in reality; more wonderful in their relative yearly values. The shows each year are cyclometers of progress.

## THE SHOW AT A GLANCE

Machines displayed .....	258
Gasoline cars .....	185
Electric cars .....	45
Steam cars .....	9
Large Electric Trucks .....	7
Large Gasoline Delivery Wagons....	5
Motor Bicycles .....	7

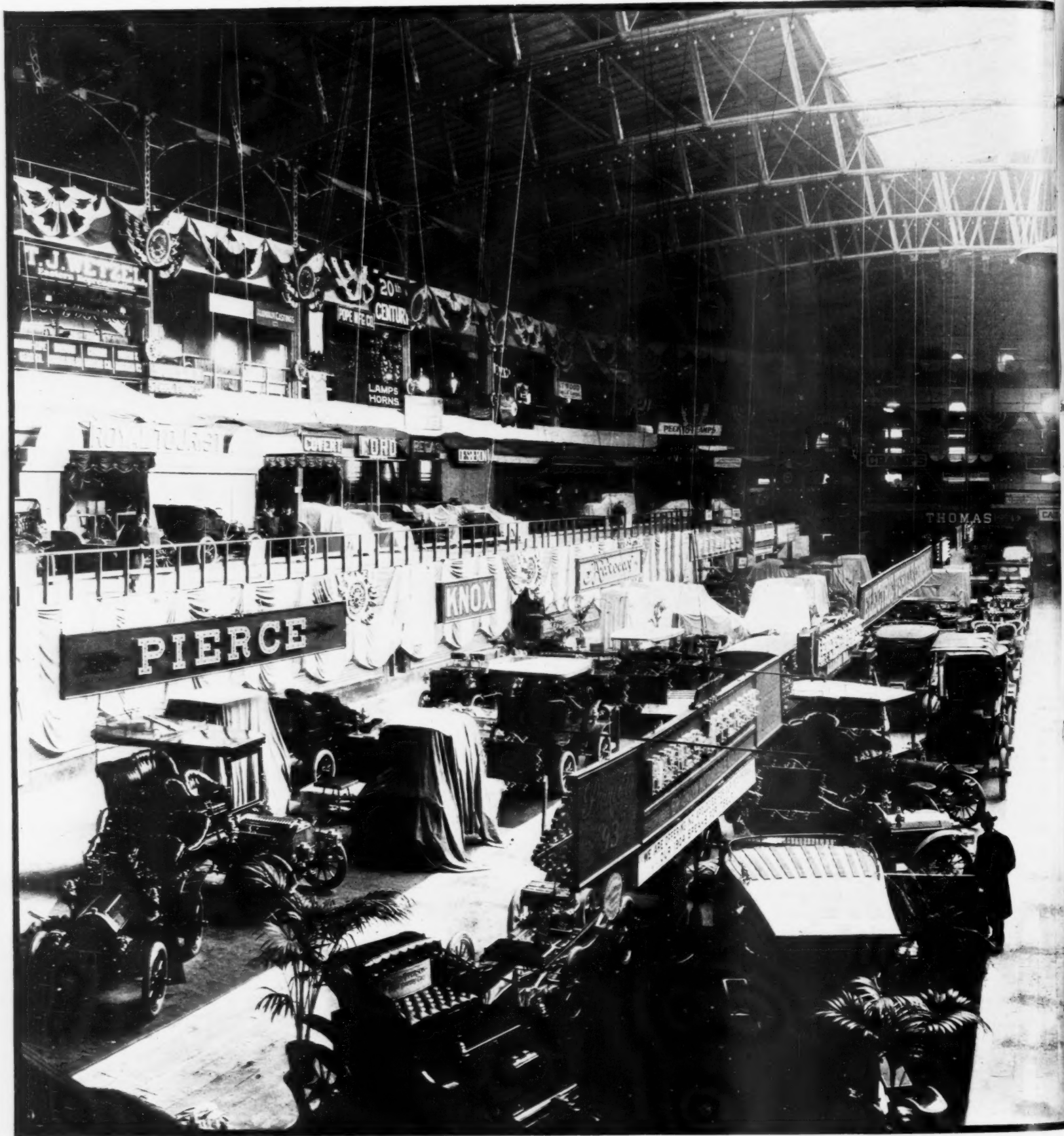
### IN THE GASOLINE CARS THERE WERE

Chassis .....	33
Open Tonneaus .....	66
Tonneaus with Tops .....	35
Runabouts and Miscellaneous.....	35
Limousines .....	11
Surreys .....	5

### THE MOTORS WERE

Water-cooled .....	156
Air-cooled .....	29
Four-cycle .....	181
Two-cycle .....	3
Compound .....	1
Four-cylinder Vertical.....	82
Double Opposed Cylinder.....	41
Single-cylinder Horizontal.....	25
Double-cylinder Vertical.....	17
Single-cylinder Vertical.....	14
Triple-cylinder Vertical.....	5
Triple-cylinder Oblique.....	1
Jump Spark Ignition.....	158
Make and Break.....	21
Both .....	6

VIEW OF MAIN HALL OF MADISON SQUARE



FOURTH ANNUAL NEW YORK AUTOMOBILE SHOW

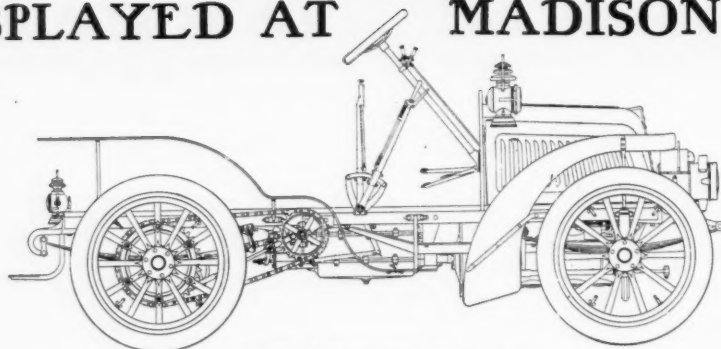


## GARDEN, LOOKING TOWARD FOURTH AVENUE



UNDER THE AUSPICES OF A. C. A. AND N. A. A. M.

# CARS DISPLAYED AT MADISON SQUARE



BERG 15-HORSEPOWER CHASSIS



**BERG AUTOMOBILE Co.**—The Berg company shows the chassis of two and four-cylinder cars. In each model the transmission is through sliding gears, propeller shaft and bevel gear final drive. The motor is not greatly novel, but seems to be carefully built and with close discrimination in the arrangement and proportion of parts. All valves are mechanically operated and interchangeable, the exhaust valves being on one side and the inlet on the other side of the cylinders. The cone driving clutch is backed by a spring to prevent sudden gripping. The entire running gear construction is substantial, the wheel base is long, the springs long and wide and the axles heavy. The braking system includes expanding hub brakes. The two models are rated at 18 and 24-horsepower, respectively.

**DESBERON MOTOR CAR Co.**—Two large machines are located in the first tier of the balcony, and proof that they run is shown by the wear displayed in testing the machines. Both cars have bodies of the king of the Belgians type. In the style E the motor is of the four-cylinder vertical type, and is rated at from 30 to 36-horsepower at 1,000 revolutions. The gear is of the sliding type, giving four speeds forward and one back. The radiator is of the honeycomb type but laid in the form of shelves, and this with the tank permits a 12-gallon water capacity. The car is fitted with brakes on the differential and also on the wheels, and when the brake is set the clutch is automatically released. The ignition device is of a simple sort of make and break, with magneto for the current. The wheel base is 90 inches, the wheels 32 inches and the tires  $4\frac{1}{2}$  inches. The model D is also a four-cylinder car rated at from 12 to 15-horsepower. There are three speeds forward and jump spark is used, and other than being smaller all around is about the counterpart of the model E.

**THE AUTOMOTOR Co.**—Exhibit consists of one four-cylinder touring car. The engine is made with the exhaust valves set to one side and the inlet valves opposite. All valves are mechanically operated. The transmission gear is of the planetary type, provides three speeds forward and one reverse and connects with the rear axle bevel gear drive, two universal couplings being used in the shaft. The radiator is of the Mercedes type fitted in front of a large square hood. Front seats are divided. The car is fitted with a large folding top, the front of which is strapped to the dash.

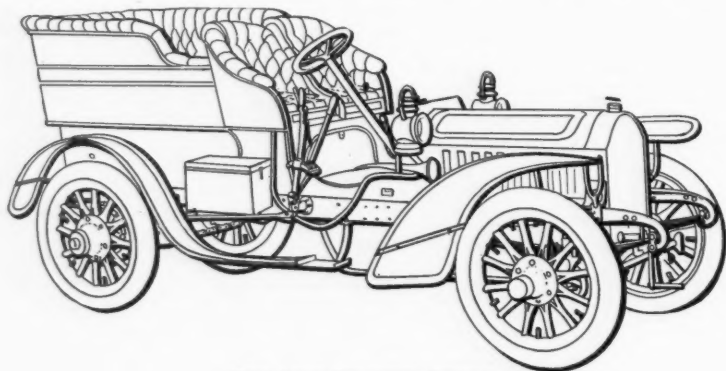
**PEERLESS MOTOR CAR Co.**—Two four-cylinder cars are shown, one of 24 and the other of 35 horsepower. The smaller car has three speeds forward and reverse and the larger four forward speeds. In most other particulars the cars are the same, with the exception of dimensions, etc. The frame is of pressed steel and the wheel base is extremely long, being, in the 35-horsepower car, 102 inches. The wheels are 34 inches in diameter. The motor inlet valves are mechanically operated from the same cam shaft that operates the exhaust valves. This shaft also drives the ignition device and the force feed lubricator. In addition to the regular jump spark ignition system, the motor is fitted with a make and break system which may be used interchangeably with the other. The clutch is a little different from that used

last year, being of the internal conical type; the same system of sliding gear transmission is also used. All of the speed changes are made with a single lever. There are no idle gears in use on the direct drive and there are interlocking devices to prevent the locking of the clutch when gears are not properly in mesh. The final drive is through a propeller shaft with universal joints and bevel gears, to a live rear axle running in a peculiarly arched stationary shaft.

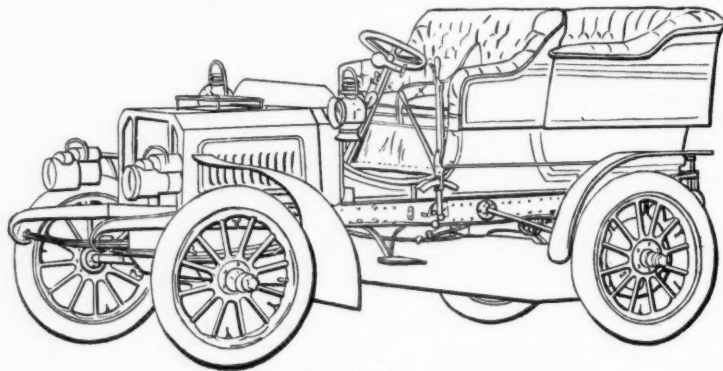
**ROYAL MOTOR CAR Co.**—The two-cylinder, 16-horsepower Royal is a decided departure from the Hoffman car of last year, the reorganization of the old Hoffman company having been coincident with the redesigning of the product from stem to stern. The new car has a pressed steel frame mounted on 2-inch semi-elliptical springs, 42 inches long in the rear and 36 inches long in front. The wheel base is 90 inches and the wheels 30 inches in diameter. The motor is a typical double-cylinder upright with mechanically operated inlet valves, jump spark ignition with two sets of batteries and both governor and head control. The clutch is of the self-contained cone variety with a universal joint between it and the transmission gear case. It is pedal operated. The transmission gear is of the sliding variety, furnishing three speeds forward and reverse and with a final drive through a propeller shaft and bevel gears. There is a brake on the transmission shaft and also the usual wheel brakes. The application of either disengages the clutch. The speed changing device interlocks with the clutch so that it is impossible to make a change of gears without disengaging the clutch. The radiator is of the heavy brake variety and the bonnet is of one of the popular adaptations of the Mercedes style. The body is of aluminum and is a modified king of the Belgians in design.

**F. B. STEARNS Co.**—There are no great changes in the Stearns car over the previous pattern. It has the same general construction of wood armored frame, double opposed cylinder motor under the body, sliding gear transmission and single chain drive. The body also is much like that of last year, with perhaps a more roomy tonneau, and deeper upholstery. One of the principal novelties in its construction is a water pressure oil feed working in conjunction with and dependent upon the water circulation. A new carbureter is also used, this being constructed with the throttle and the air regulating valve connected to be actuated simultaneously by the same lever, so that when the throttle is opened or closed a corresponding change in the proportion of air and gasoline in the mixture will result. The intake and exhaust valves are much larger than before, but have less lift, the springs being heavier.

**BAKER MOTOR VEHICLE Co.**—Light drawbar pull has ever been the war cry of the Baker company, and all of its numerous light and medium weight electric cars evidence this principle of construction. The single seat cars are improved patterns of last year's line and are characterized by the same tubular running gear construction, wire wheels, ball bearings, motor suspended centrally under the frame, and single chain drive. The newest model of the line shown is the surrey, which was described recently in *MOTOR AGE*. This is somewhat on the lines of a gasoline car



THE FOUR-CYLINDER PEERLESS

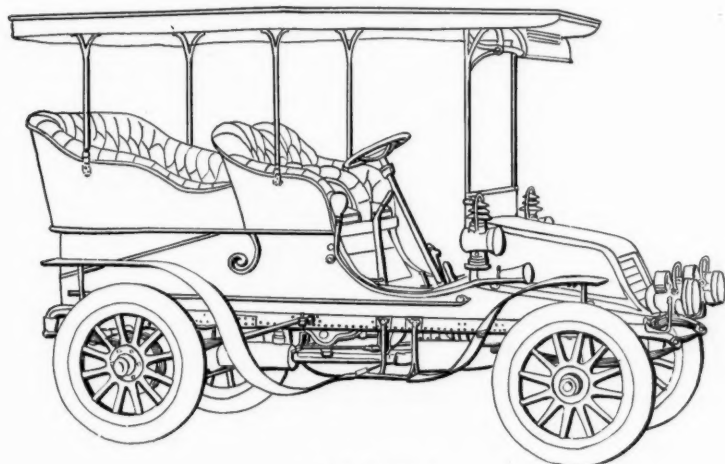


THE STEARNS



with an imitation motor bonnet in front. It has wood wheels, but in motor, drive and axle particulars is of the same character as the smaller Bakers.

**WINTON MOTOR CARRIAGE CO.**—The Winton in exterior appearance is much the same Winton as last year, the notable difference being the canopy top and swinging glass front which is now a part of the regular equipment. In its construction are several changes, which are not radical, but rather the result of some little study and experiment. The tonneau is wider and deeper and is fitted with a door seat. The wheels are 34 inches in diameter and fitted with  $4\frac{1}{2}$ -inch tires. The increased diameter of the wheels is supplemented by higher sprocket gearing to give increased speed. The rear springs are 8 inches longer than formerly and of more leaves. The front springs are also longer. The rear springs are equipped with rubber bumpers. The transmission gear has been changed, by using cone clutches instead of the flat surface friction clutches previously employed. The male members are made of case hardened and ground steel and the female members of phosphor bronze. This clutch, running in oil, is said to be almost unsusceptible to the ordinary tendencies toward wear. The lubricating system has been entirely changed. The new system comprises the pump forced circulation of 2 quarts of lubricating oil which is used over and over again. About every 500 miles the oil is drained off and a fresh supply put into the reservoir. It is said that the system is entirely automatic. There are also several other minor changes throughout the car. An

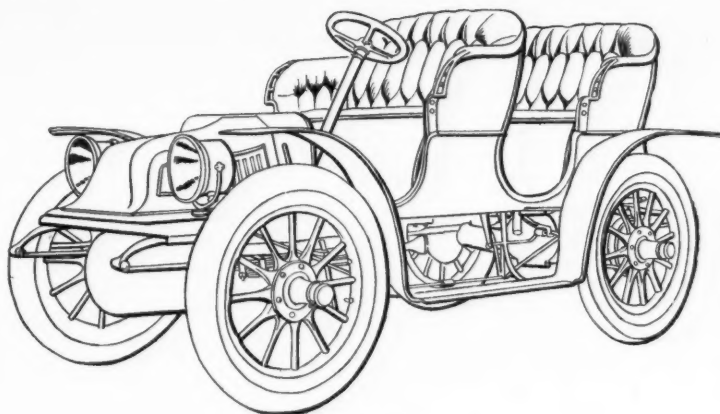


THE WINTON

interesting feature of the exhibit is a motor run by electric power showing the operation of the lubrication, ignition and water circulation systems. Outlet cups are arranged at the bearings so that the spectator may see the movement of the oil, while an outlet and funnel attached to the radiating apparatus shows the passage of the water. The contact breaker box is exposed, as are also the cylinder heads, to show the action of the ignition system.

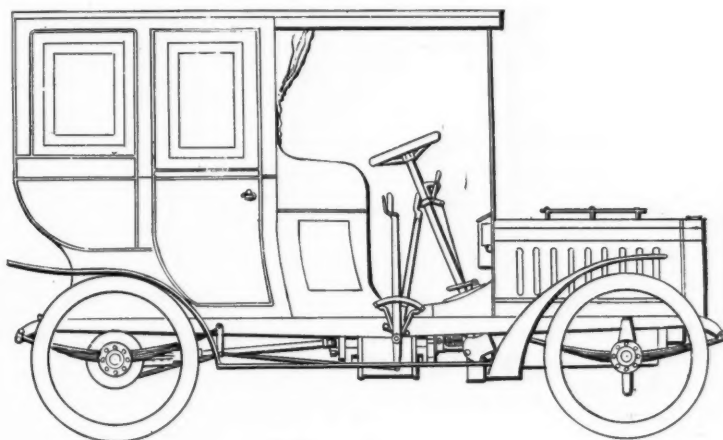
**ALDEN SAMPSON MFG. CO.**—The frame of the four-cylinder touring car shown is of wood, armored with steel plates. The motor and transmission are on an angle steel sub-frame suspended by two semi-circular girders. The wheel base is 88 inches, the tread 50 inches and the wheel diameter 32 inches. The springs front and rear are 34 and 36 inches respectively. The axles are solid and the steering knuckles are of the Lemoine pattern. The motor is of 4-inch bore and  $5\frac{1}{2}$ -inch stroke, said to develop 18 brake horsepower at 810 revolutions. The cylinders are cast in pairs. The inlet valves are atmospherically operated and are directly over the exhaust valves. A centrifugal governor acts upon the throttle. The regular ignition is by jump spark of two optional kinds, one with four and the other with one coil. In either, a dynamo and storage battery is used. Choice of force or gravity feed lubrication is offered. The motor governor may be cut out of service by pressure upon a pedal. The Baladeur system of sliding gears, furnishing four forward speeds and a reverse drive is used. The final transmission is by double side chains.

**HOWARD AUTOMOBILE CO.**—Most interesting of the Howard models is a four-cylinder car called the "tonneau-de-luxe." This has a double tonneau, so that altogether there are six individual seats and a folding rear door seat. Equal to it in character and price is a combination car of the limousine order with removable top and windows. When the coupe part is detached the front section of the roof may be left so that with both the front and back glasses in position and the side curtains dropped, the operator is entirely enclosed. The back glass of the front seat is removable and may be dropped into a pocket. The car is built upon a pressed steel frame of 90-inch wheel base. The wheels are 34 inches in diameter, with ball bearings in front and



BAKER ELECTRIC SURREY

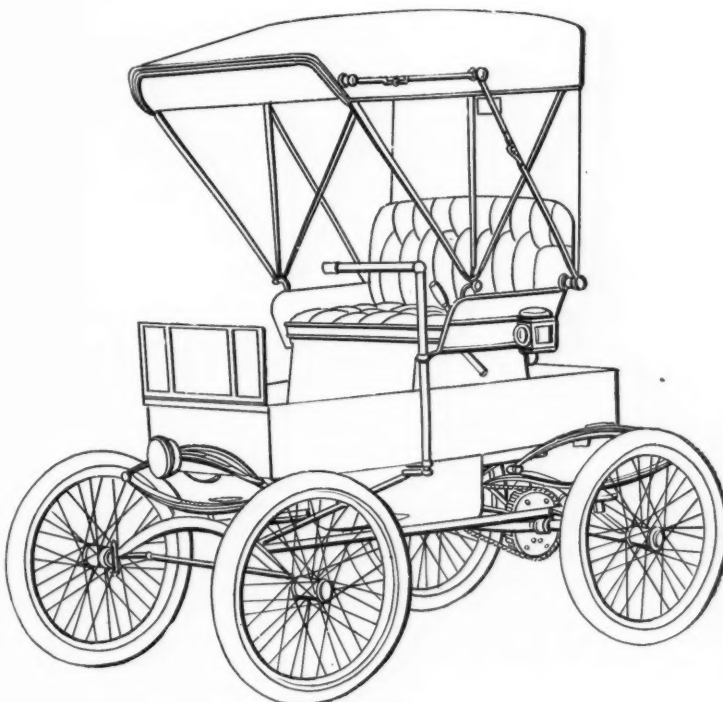
roller bearings in the rear. The semi-elliptical springs are extremely long. The motor is of  $4\frac{1}{2}$ -inch bore and 5-inch stroke. All valves are mechanically operated and interchangeable. The cooling system includes a disk radiator and a circulation indicator on the dashboard at all times. The clutch is of the Panhard cone pattern, operated by a pedal. The transmission gear is of the sliding gear style enclosed in an iron case and with a direct drive for the high speed. The final



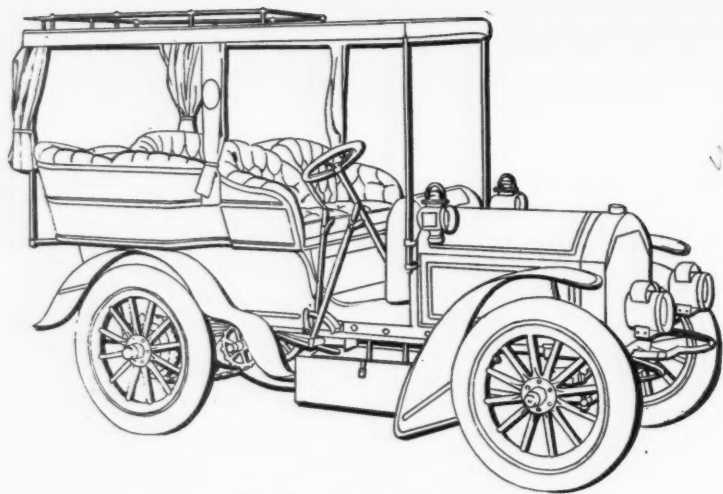
HOWARD LIMOUSINE

drive is through a propeller shaft with universal joints and bevel gears. The company also manufactures one and two-cylinder models.

**LACKAWANNA MOTOR CO.**—One car made by the defunct Conrad Motor Carriage Co., of Buffalo, both of the combination runabout-surrey type, with folding back seat, is shown. The motor, of the double vertical cylinder two-cycle type, is practically the same as when first introduced early in the season of last year.



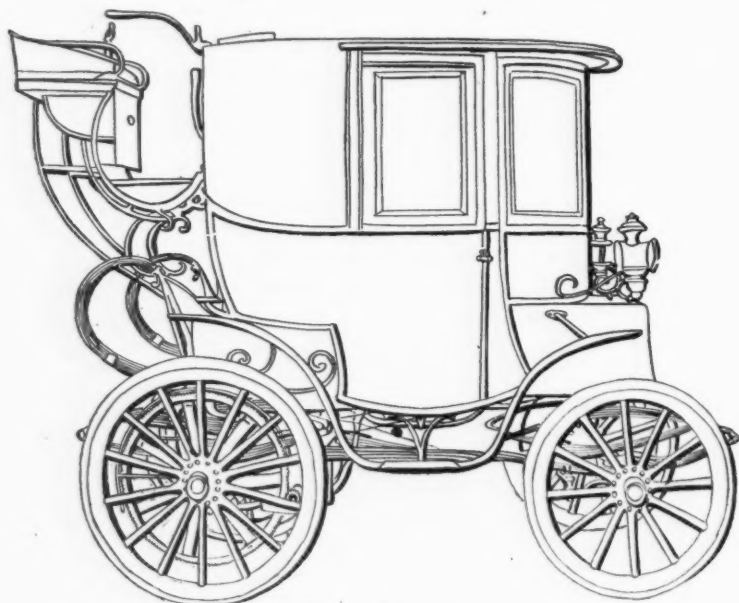
BAKER IMPERIAL



THE APPERSON BROS. CAR

APPERSON BROS.—Three models are shown at this exhibit. The largest is 40-horsepower and has four individual seats in the tonneau. The motor has four vertical individual cylinders with mechanical valves and is equipped with one float feed vaporizer. The sliding gear transmission has four forward speeds and reverse. The differential is in the gear box and the final drive is by two outside chains. The car is geared at 45 miles per hour on the fourth speed with the motor at 780 revolutions. The second model is a four-cylinder car with a specially designed body resembling the king of the Belgians pattern, with rear seats for two and a third seat on the door of the tonneau. The front seats are individual and all are of aluminum. The motor is said to develop 25 horsepower. The rear wheels are 34 inches in diameter and the front ones 32 inches. The wheel base is 92 inches. The springs are semi-elliptic, 44 inches long. The two-cylinder car is of the regular touring pattern with seating capacity in the tonneau for four passengers and an extra seat on the door. The motor develops 24 horsepower at 950 revolutions. Sliding gear transmission with three speeds forward and reverse is used, controlled by one lever. The car is driven by a single roller chain. Wheel steering with nut and screw is used. This car weighs 2,400 pounds.

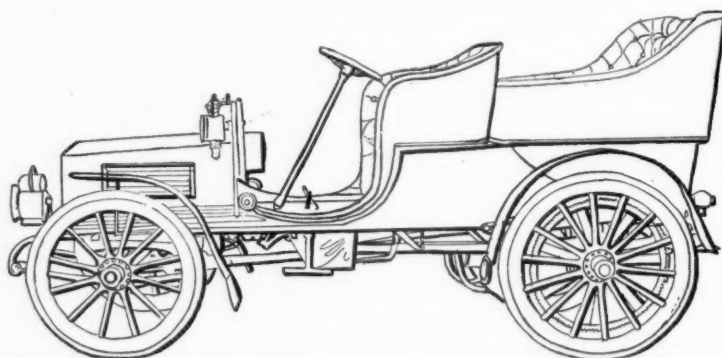
WOODS MOTOR VEHICLE Co.—All the vehicles exhibited, except the runabout, are built upon the Woods standard gear. This gear has two  $3\frac{1}{2}$ -horsepower motors, and either side or front lever steering is used. Both front and rear axle are solid steel forgings connected by a forged steel frame. The motors are bolted close to the rear axle. By means of a single train of gears each rear wheel is independently driven by one of the motors. The single train of gears consists of a small pinion revolving with the rotating member of the motor and meshing with a large gear rigidly fastened to the rear wheel. The axles are slightly arched downward and the wheel spokes are slightly beat outwards. These bear such an angular relation to each other that the lower spoke is perpendicular to the ground. The controller gives four speeds forward and reverse. There are two sets of brakes, one of which is operated by a reverse motion of the same lever that applies the power, and



WOODS BROUGHAM

the other is applied directly to the hubs of both the rear wheels and is operated by the foot. The runabout has but one motor and has a differential gear. The batteries used are either the Porter, Exide or Helios-Upton, unless some other make is requested.

KIRK MFG. Co.—This exhibit has the Yale car. The front of the car is built on the Mercedes lines, with continuous coil radiator, surrounded by the hood. The hood and balance of the car is trimmed in brass. The frame of the hood extends about 3 inches below the body hangers, giving a filled-in appearance to the front of the car. The design is new and attractive. The engine is of the double cylinder, opposed variety, rated at 16 horsepower. One carbureter and one coil are used for both cylinders. The transmission gear is of the planetary type, similar to the one used on the 1903 model, but heavier. Two control levers are provided, one controlling the low and high speed forward, the other controlling the reverse and emergency brakes in the rear wheels. A foot brake lever also operates a brake on the differential. Single chain drive is used. Circulation of water is secured by a positive pump, mounted on the end of the two to one shaft. Jump spark ignition is used and all piping for water is of copper. Two battery boxes are provided, one being carried on each side step. The car is fitted with canopy top, glass front and side lamps. The finish is Yale blue lined with fine stripes of blue of lighter shade. The car is fitted with 32 by  $3\frac{1}{2}$ -inch tires on the front wheels and 32 by 4-inch tires on the rear wheels. One Yale motor cycle is exhibited. The motor is made with balance wheel outside the case. The gasoline tank contains the carbureter, being constructed in the forward end of the tank, close to the cylinder head. Between the carbureter and intake valve is a throttle valve, the same being operated by a lever leading to the top of the tank. The spark control lever is mounted in the same manner. A flat rawhide



WOODS ELECTRIC TONNEAU

belt  $1\frac{1}{4}$  inches wide is used for transmitting power to the rear wheel. The muffler is fastened directly under the motor, to the lower tube of the bicycle frame. The forks have extra braces running to the head and are mounted on a set of springs, to absorb vibration.

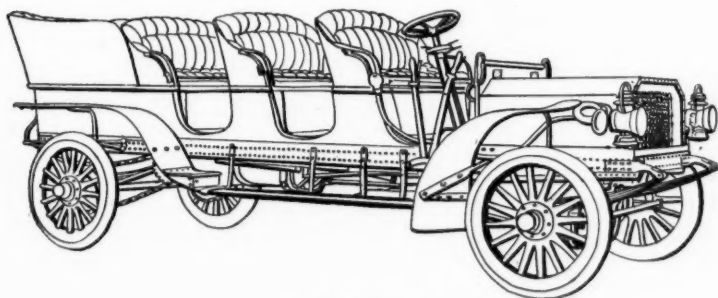
TWOMBLY MOTOR CARRIAGE Co.—That some makers of automobiles believe steam is the correct power for road vehicles is demonstrated in the production of the Twombly, which is something of a departure from the types heretofore shown in this country. One strong point is made in that there is not a single part of the car that can burn, the body being made from aluminum, the wheels from steel, and even the flooring is aluminum. The engine is horizontal and is a single acting four-cylinder compound, rated at a 12 horsepower as a compound or a 24 horsepower direct acting. The cylinders are opposed and connected directly to a solid crank shaft. The engine is without crossheads, stuffing boxes, packing or piston rods and is entirely enclosed, with the working parts running in oil. The boiler, also, is horizontal, and a door opening from each side of the car provides access to the ends of the boiler, so that a tube may be expanded with no trouble. Besides an automatic regulator the car is provided with a water alarm, a Klinger gauge, and a fusible plug, which when burned will shut off the fuel and extinguish the fire. The valve can be screwed down and the car can be operated without the plug after being melted. The boilers are of the fire tube kind, supplemented by a flash coil containing 60 feet of  $\frac{1}{4}$ -inch tubing placed directly over the fire, through which tubing the feed water passes on its way to the boiler. All the controlling levers—throttle, reverse and the high and low pressure cut out—are placed directly under the wheel on the steering post. Dials on the dash show the steam pressure, fuel supply, water supply. The feed pumps are enclosed, but the check valves are outside. The seating capacity of the car is for five people, being large and roomy, having a wheel base of 92 inches, and weighing 1,800 pounds. The fuel tanks



carry 12 gallons of kerosene and 18 gallons of water, sufficient, it is claimed, to run 150 miles. The car sells for \$2,500.

**MACK BROS. Co.**—The Manhattan car is a departure from the usual omnibus style in vehicles carrying from ten to thirty passengers. The car has a long drawn out surrey body with combination cross seats, each holding three or four persons. There is a tonneau, the entrance being either at the side or rear, as desired. The car exhibited has a seating capacity of twenty people, with entrance to the tonneau at the side. The wheels are 36 inches in diameter, of the artillery pattern, and with 4-inch solid tires. The transmission is by sliding gears with three speeds forward and a reverse. A cone clutch is used and double outside chain final drive. The foot brake acts on separate drums on the counter shaft and the emergency brake acts direct on the rear axle. The engine is four-cylinder, vertical, and both the inlet and exhaust valves are mechanically operated. The motor is rated at 36 horsepower at 600 revolutions. The cars weigh from 4,000 to 5,000 pounds.

**STUDEBAKER BROS. MFG. Co.**—All the Studebaker electric automobiles have certain characteristics in common. The frames of the running gears on the runabouts and stanhopes are of tubular steel and are independent of the bodies. The wheels are wood of the artillery pattern and have double tube detachable pneumatic tires, except on the surrey, which has solid tires. The spring suspension provides full elliptic springs in the rear and semi-elliptic in front. On the single-seated vehicles one motor is used, which is suspended from the frame of the running gear. The drive is by chain. On the victoria and the surrey the running frame is integral with the framework of the body, which is heavily reinforced by steel rocker plates. The surrey has two motors, each rated at 12 amperes and 80 volts. Two separate brakes are provided on all the vehicles, one of which works on drums on the rear axle adjacent to the rear wheel hubs. The other brake works on

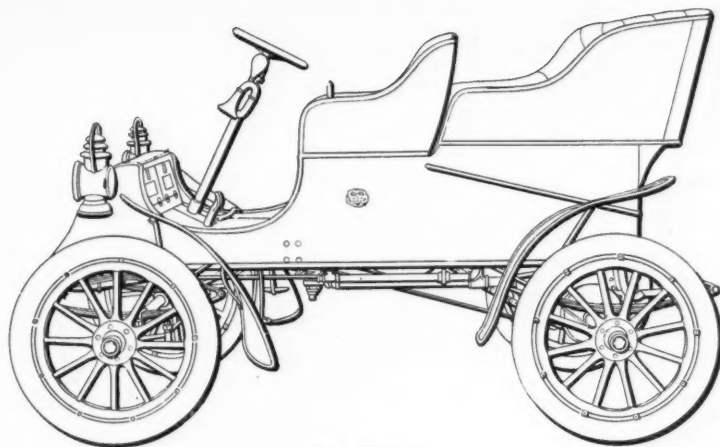


THE MANHATTAN

the counter shafts of the motors. The controllers give four speeds in either direction. The model C gasoline touring car has a horizontal, two-cylinder opposed motor with mechanically-operated inlet and exhaust valves. The motor is rated at 16 horsepower. Planetary gear transmission is used and the drive is by roller chain to a spur differential on the rear axle. Two forward and one reverse speed are provided. The wheel base is 7 feet 2 inches and the tread is 4 feet 8 inches. The wheel steering is irreversible. The model A is rated at 8 horsepower and is similar to model C in general construction. The gasoline delivery wagon uses the same running gear as above described.

**SIDNEY B. BOWMAN AUTOMOBILE Co.**—The Bayard cars, more popularly known as the Clement, after their maker, A. Clement, are exhibited in several styles and sizes, including the 12, 20 and 30-horsepower voiture legere class and the 20-horsepower carrosseries, the latter having glass front and folding top covering the entire car when up. While certain styles are shown and catalogued, announcement is made that any kind of bodies may be had. The frames of the Clement are of hydraulic compressed steel and are perfectly straight, the semi-elliptic springs on either end being fastened underneath. In the motor construction both the jump and make and break spark are used, according to the size of the motor. The usual sliding gear, operated with one lever, is used, and the cars bear the earmarks of the latest French construction all through.

**FORD MOTOR Co.**—Ford racer 999, famous as the first car in the world to go a mile on a circular track in less than a minute, and more recently brought again into fame by reducing the straightaway record to 39.25 seconds, stands in its shapelessness in wonderful contrast to the little Ford runabouts and light tonneau cars. One can hardly realize that the two machines are the creations of the same designer. The regular Ford car is much the same as at the time it was described in *MOTOR AGE* last August, having the angle steel frame supported by four full elliptic springs, with the double opposed cylinder motor mounted upon the left side of the frame near its middle, and with the



THE FORD

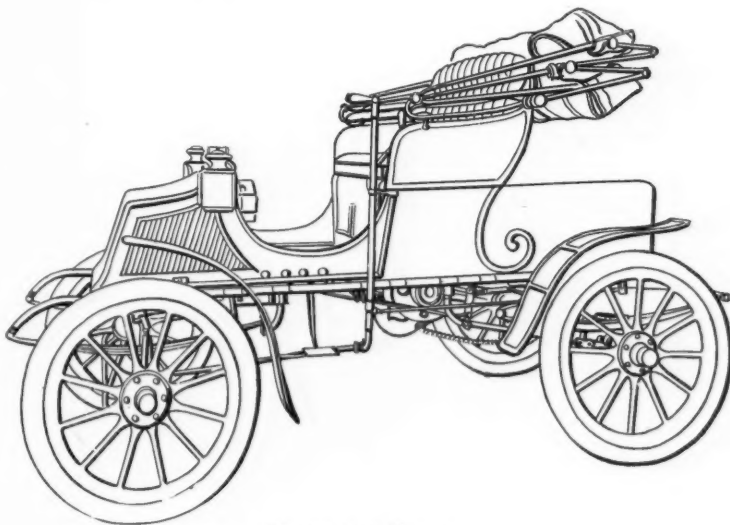
water and gasoline tanks grouped around the flywheel and planetary transmission case.

**BUCKMOBILE Co.**—One runabout is exhibited, finished in oak throughout. The frame is carried on two side springs. The platform has, in addition, two wood supports resting on each axle, almost parallel with the springs. The front axle, to accommodate the wood supports, is bent upward a short distance from the yokes, then is run across, forming an arch and allowing of more than ordinary clearance. The engine is of the double cylinder vertical variety, rated at 15 horsepower and carries a planetary gear on the outer end of its shaft. Two speeds forward and one reverse are provided for, and controlled by one lever. All valves are mechanically operated. Split rear axle, with single chain drive, is used. A surrey seat, detached, is exhibited, it being intended to mount on the platform back of the main seat. This is also finished in oak.

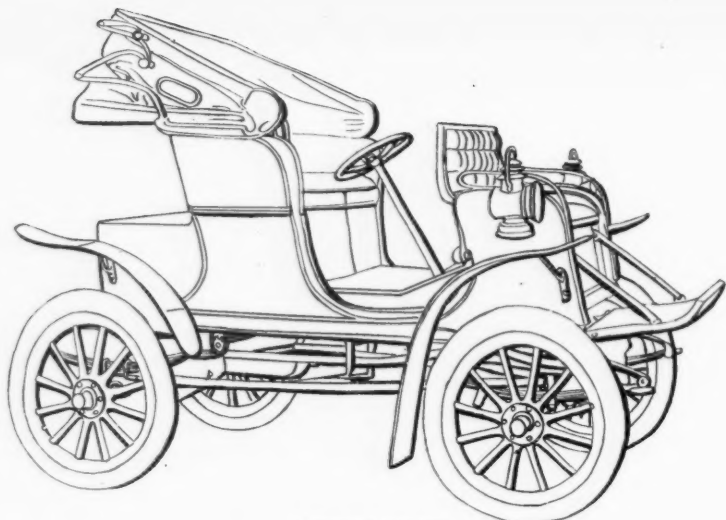
**THE FISCHER MOTOR VEHICLE Co.**—The exhibit consists of a heavy truck, the power of which is primarily furnished by a gasoline engine. To the engine is connected a dynamo which generates the power to drive the two motors, which in turn drive the rear wheels. A storage battery is carried for the purpose of storing surplus current. Under ordinary conditions the generator supplies the current direct to the motors, but when climbing a steep grade, where extra power is required, the battery is automatically thrown into action and assists the generator. The truck is fitted with rubber tires, extremely wide in cross section and has a capacity of 5 tons.

**C. L. CHARLEY**—On account of the recent newspaper notoriety given the importers' fight the Mercedes-Simplex formed no small attraction, and if the fight made will have any effect it will be to sell cars of all foreign makes. Several of the latest types are shown in the restaurant section. For 1904 the Mercedes people are putting out 20 to 24-horsepower, 28 to 32, 40 and 60-horsepower cars, and later in the season a specially long frame, for side entrance, will be out. This firm is fitting its new cars with pressed nickel steel frames, but other than in design and details little change is apparent.

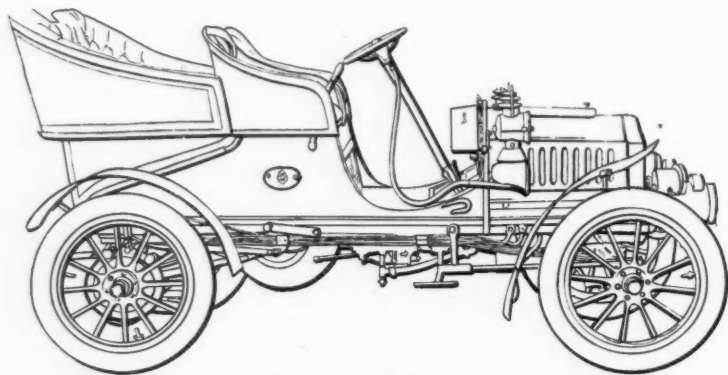
**VEHICLE EQUIPMENT Co.**—The exhibit is composed of one rear boot coupe, one landaulet, one straight front brougham, one victoria, two 5-ton trucks, one express wagon, one 3-ton and one 2-ton truck. The pleasure vehicles show handsome decorations inside and out. All cars exhibited were finished in dark blue with trimmings to match.



STUDEBAKER ELECTRIC



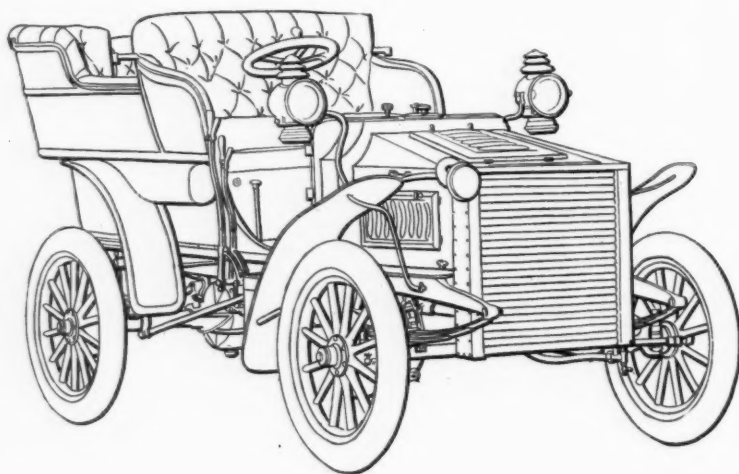
STEVENS-DURYEA



OLDS TONNEAU CAR



BUFFALO ELECTRIC STANHOPE



WHITE STEAMER

**J. STEVENS ARMS & TOOL CO.**—In the Stevens-Duryea car the only change from last year is the addition of a double acting emergency brake operating on the rear wheel hubs. This brake works in both directions. The frame is of extra heavy tubing with four elliptic springs. The wheel base is 5 feet 9 inches, and the tread is 4 feet 6 inches. The motor is of the two-cylinder opposed type, developing 7 horsepower at 600 revolutions a minute. The cylinders are water-jacketed, the jacket being part of the same casting. The exhaust valve chamber is jacketed and is cast with the cylinder. The inlet valve chamber is a separate casting. The carbureter is of the float feed kind. The inlet valves are operated by suction. The ignition and throttle are regulated by hand and are entirely independent of each other. The lubrication of the motor is accomplished by means of a multiple gravity oiler mounted on top of the crank case. In the transmission the internal friction clutch is used, and the spur gears are always in mesh, there being an individual clutch for each gear. The final drive is by roller chain and the differential is of the spur gear type. There is one hand lever for all three forward speeds and the reverse speed. The body is of stanhope design with a capacity for carrying four persons. The motor is started from the seat by means of a short crank attached to the steering post.

**OLDS MOTOR WORKS**—The show visitors are generally familiar with the regular Olds runabout and delivery wagon; hence the magnets of the exhibit are the new convertible tonneau and touring runabout. The trade itself has been waiting for the Olds company to spring something along this line and so the two cars are generally interesting. The light tonneau car is driven by a single cylinder horizontal motor of 5½-inch bore and 6-inch stroke, rated at 8 horsepower. The motor is set with the cylinder head at the forward end of the machine under the footboard. The fixed half of the main bearings are set at an angle of 45 degrees, thereby taking the chain pull and the motor thrust upon a solid bearing. The worm gears are encased, running in oil. The construction is such that the cylinder can be removed from the crank case without disturbing any other part of the motor, or the crank shaft; flywheel and transmission gears can be lifted off without disturbing the rest of the motor. The wheel base is 83 inches. Roller bearings are used in all wheels. The induction coil and switch are placed on the dashboard. The bonnet is of sheet metal with brass trimmings, at the front being a honeycomb radiator, and inside are the water and gasoline tanks and batteries. The angle steel frame upon which the motor is hung completely supports the body, and as the body separates at the footboard it is easily removed. The bonnet, dashboard, brake levers and steering post all remain attached to the frame. The brakes act upon the hubs of the wheels and upon the differential. The steering apparatus is of the worm gear type, the steering post tilting back and forward at the axis of the gear, enabling the wheel to be adjusted. The spark and throttle levers are on the steering wheel. High and low speed are obtained by a side lever, and reverse and brakes by foot levers. The carbureter is of the regular Olds pattern. The touring runabout is of the same general design as the tonneau, but is lighter and built more along runabout lines. The motor is a 6-horsepower single-cylinder engine of 5 by 6-inch bore and stroke. The wheel base is 76 inches.

**BUFFALO ELECTRIC CARRIAGE CO.**—The stanhope which has for several years been this company's leader is substantially unchanged. The addition to the line is the electric tonneau, in which conventional tonneau lines have been followed and in which the batteries are carried entirely within the body. It was this car which made the recent run from Boston to New York, reported in MOTOR AGE at the time. The body is supported on platform springs and the wheels are 34 and 36 inches in diameter, front and rear respectively. The car is driven by two 3-horsepower motors, capable of an overload to 10 horsepower for a short period. The controller handle is directly under the steering wheel. The motors are suspended between the body and rear axle. The transmission is by spiral gears with expanding brake shoes inside. There are six forward and four reverse speeds. The maximum speed is 20 miles an hour.

**WHITE SEWING MACHINE CO.**—The White steam touring car with a canopy top is unquestionably the most interesting steamer on exhibition. It has been improved since last year, but not by radical changes. The tonneau is more luxuriously upholstered and is deeper and more roomy. A wind shield has been placed in the bonnet between the condenser and the engine, increasing the efficiency of both. Both of the automatic oil cups on the dashboard have been equipped with hand pumps. The spring suspension has been improved, as have also the universal joints in the transmission system, the latter affording greater wearing surface and more convenient means of lubrication. The live axle, which as before, is made of nickel steel, has been increased 3-16 inch in diameter. The gasoline tank capacity is 10 gallons and that of



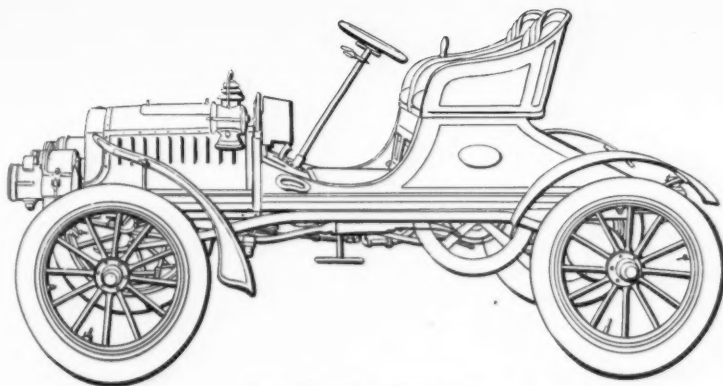
the water tank 15 gallons. It is said that this gives a running radius on one charge of 100 miles. The weight of the complete car is 1,600 pounds. In addition to the regular touring car and to a limousine model, the company has a delivery model.

**THE GIBBS ENGINEERING & MFG. CO.**—This exhibit is of an electric truck which is said to have accomplished several highly satisfactory test runs within the last few weeks. The machine is put out in any form of commercial body and is built in 3, 4 and 5-ton sizes. The running gear is of steel channel, hot riveted and with strong bracing. The body is separate from it, no part of the mechanism, control or wiring being a part of the body. Steel wheels have been substituted for the wood wheels previously used. The distribution of the weight has been altered to throw more of it than ordinarily upon the front tires. The design and size of the body is subject to the purchaser's specifications. The motor is flexibly supported underneath the running gear frame and drives to a countershaft, from whence the final drive is directly to the rear wheels by double side chains. The company is making an effort to introduce this machine into the heavy lines of street transportation and has made an effort to produce cars which may be readily adapted to the ordinary purposes of such traffic.

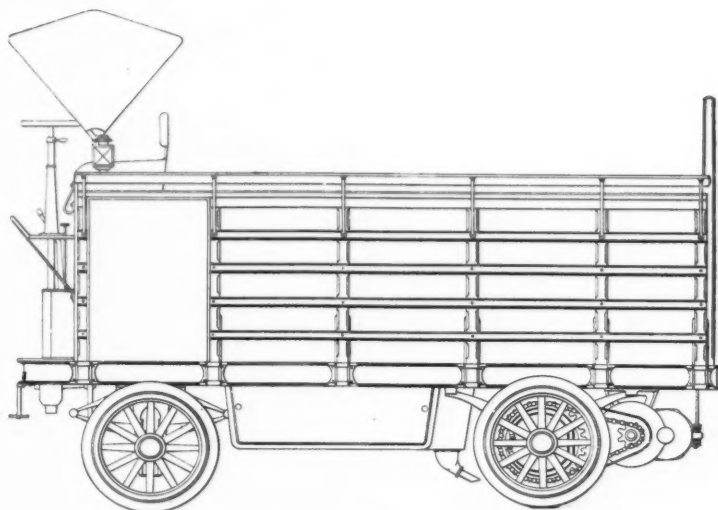
**H. H. FRANKLIN MFG. CO.**—While the remodeled light pattern of the Franklin shows several improvements upon the 1903 pattern in detail and especially in body design, the most interesting feature of the display is the chassis of the more recently developed 24-horsepower model, which characterizes the growth of the air-cooled motor from its customary small size to the proportions of a full-fledged touring car motor. The running gear construction is similar to that of the smaller machine, but heavier and with much more extensive spring suspension. The wheel base is 96 inches and the wheels are 32 inches in diameter. The motor, instead of setting across the front of the car as in the other pattern, is placed longitudinally as in the case of an ordinary four-cylinder water-cooled motor. The cylinder radiating ribs, instead of being cast onto the cylinder, are of copper, while the cylinders themselves are of steel, with both the exhaust and inlet valves in the top. The inlet valves are of the atmospherically operated type, the maker believing this style is best for air-cooled motors on account of avoiding complication. A fan is used to assist the air draft. The lubrication is by splash and the ignition is by a four-coil system with dry cells and magneto. The transmission gear is of the same planetary system as that of the smaller car, but is heavier. Two speeds forward and a reverse drive are afforded. The final drive is by propeller shaft and bevel gears. The car complete with king of the Belgians body weighs about 2,000 pounds.

**AUTOCAR CO.**—The new models exhibited show many improvements. Wheel steering has been adopted, the supporting pillar also carrying the controlling levers. Projecting to the left from the steering column is the clutch lever, the handle grip of which operates the throttle in the carbureter. Above the clutch control lever is the spark control lever, so mounted as to be within easy reach of the operator. To the right, from the steering column, projects the speed changing lever, which operates the sliding gears. Two brakes are provided, one being on the main shaft leading from the rear of the speed changing gear box, the other being the emergency brake, mounted on the rear wheel hubs. American roller bearings are used in the front wheels, rear axle and in the main bearings of the transmission gear, while ball bearings are used in the universal couplings in the shaft which leads to the rear axle. Bevel gear drive is used, the whole mechanism being enclosed in oil tight cases. The motor is 4 by 4 inches, double-cylinder, opposed type; the most noticeable change made in this part of the car is that the exhaust pipe from the right cylinder, looking from the front, runs over the engine and connects with the pipe leading from the opposite cylinder, from which point it is led back to the muffler located under the rear part of the body, but to one side. A lubricator, for the engine, is carried on top of the crank case, the feed being by gravity. The lubricator reservoir has glass ends, so that the quantity of oil contained therein may be determined. The radiator is of the Mercedes type, no water tank being used except what is formed by the top and bottom of the radiator. Circulation is secured by means of a positive pump. An internal expanding clutch is used in the flywheel instead of the cone clutch formerly made. The wheels are 30 inches in diameter and are fitted with 3½-inch Fisk detachable tires. The gasoline tank has capacity for 10 gallons. Two sets of Columbia batteries are provided.

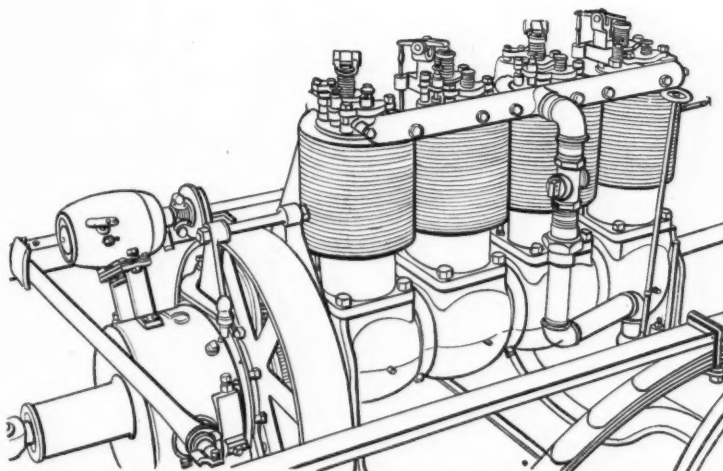
**CENTRAL AUTOMOBILE CO.**—The Mors is handled in America by this company and this machine is shown. The Mors is too well known to need more than mere mention. It differs from the majority of the French cars inasmuch as make and break ignition is used exclusively.



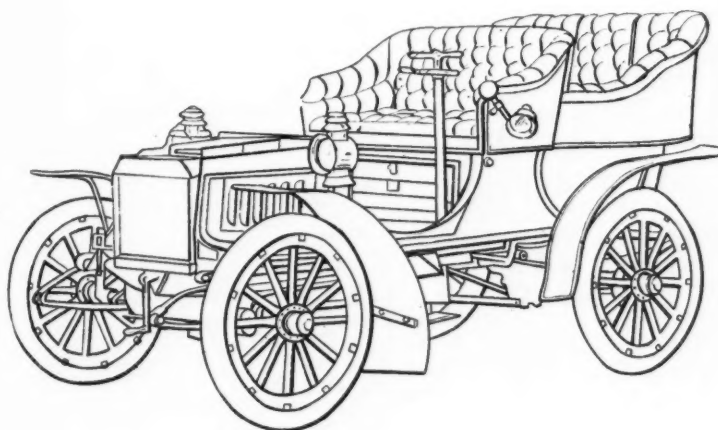
OLDS TOURING RUNABOUT



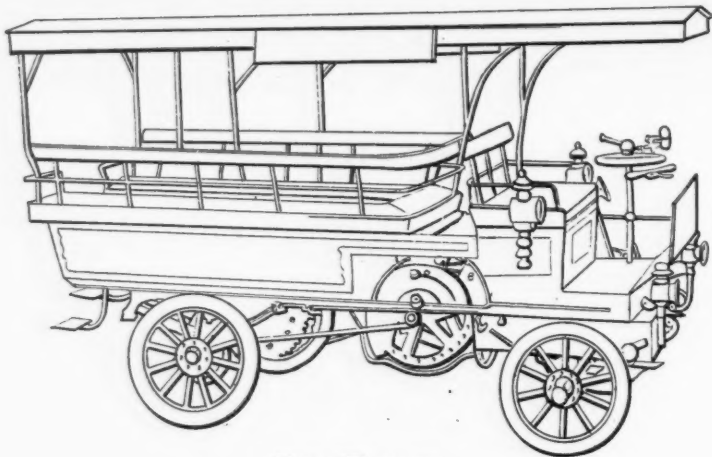
GIBBS ELECTRIC TRUCK



MOTOR OF FRANKLIN TOURING CAR



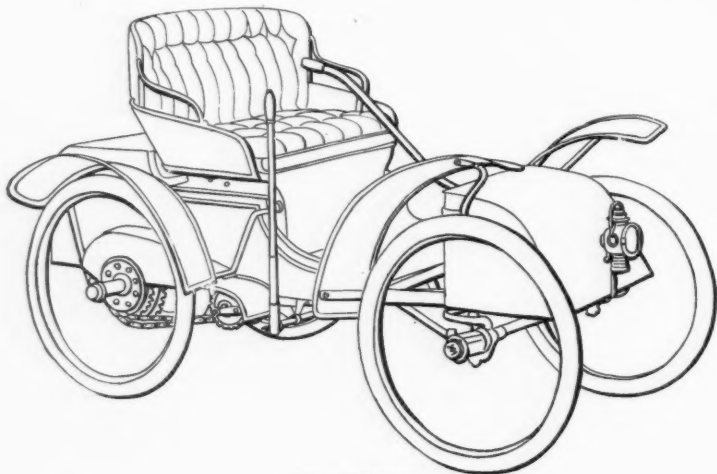
THE AUTOCAR



MOYEA WAGONETTE

In most other respects, however, the general French lines are followed, including pressed steel frames, four speeds, cone clutch and multiple tubular radiator, while the drive is by chain.

MICHIGAN AUTOMOBILE Co.—As long as the average car is wide, the little Michigan is withal the smallest real car in the show. There has been little change in the car since last season, the principal alterations being to increase the fan used in connection with the vertical air-cooled motor and to increase the size of the springs and other running gear parts. The angle iron frame is supported by elliptical springs with coil spring bumpers. The wheel base is 54 inches and the tread 36 inches. The motor is a single-cylinder engine of  $3\frac{1}{4}$ -inch bore by  $3\frac{1}{2}$ -inch stroke, and is said to be capable of running well at 2,000 revolutions. It is rated at  $3\frac{1}{2}$  horsepower. The flywheels are within the casing. The transmission is by roller chain to a counter shaft. The high and low speed clutches are on this counter shaft and from each a chain runs to the rear axle. There is no reverse, the car being so short that it can be turned around in a 20-foot circle, or picked up and set down on the road facing the other way. The spark



THE MICHIGAN

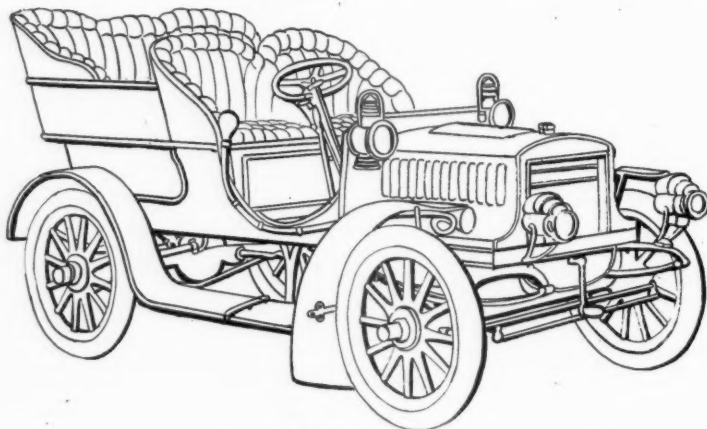
lead is manipulated by twisting the handle of the side lever controlling the gear changes. The weight of the car complete is 575 pounds. It is able to carry two grown persons and it is said that it can go 20 miles an hour.

PRESCOTT AUTOMOBILE MFG. Co.—The Prescott is another of the well-known cars which does not differ greatly from the model of 1903. It retains the features of long flexible running gear, folding front seat forming the box dash and full equipment of conveniences such as steam pumps and steam water lift for filling the water tank. The engine is heavier and of more power and the controlling mediums have been arranged so that the entire manipulation of working parts is from the seat. The burner includes a vaporizer which is said to increase the firing and consequently the steaming efficiency. What is called an anti-freezing construction of the water system is one of the notable features, especially at this time of the year.

CONSOLIDATED MOTOR Co.—This concern is the successor to the Moyea Automobile Co. and is making a specialty of commercial cars of the gasoline type. In the 1904 cars the transmission is by means of a friction wheel against two rotating discs, the axle of the friction wheels being extended past one side of the frame, upon which the chain sprocket is carried. The simplicity of the transmission scheme is generally admitted, and the company claims that with a car fitted

with the 7-horsepower motor there was no difficulty in carrying a load of 3,000 pounds and starting and stopping. Instead of jump spark the make and break form is used, with an oscillating dynamo to generate the current. While only one car is shown, the company states that it is prepared to furnish touring cars, omnibuses, delivery wagons and any sort of top required.

SANDUSKY, AUTOMOBILE Co.—The Courier is offered in two patterns, but the really new one is model B, which, like the other, is a runabout, but with an oval top, square bonnet instead of the sloping box front. It has a rectangular frame support on elliptical springs, instead of on side springs as in the older pattern. It is driven by a horizontal motor of  $4\frac{1}{4}$ -inch bore and  $5\frac{1}{4}$ -inch stroke and rated at 7 horsepower. The inlet valves are mechanically operated and are of unusually large size. The transmission is through a simple sliding gear placed on the extension of the motor shaft, the set being disposed similarly to the usual planetary gear set of runabout construction. The secondary shaft is above the main shaft and none of the gears are

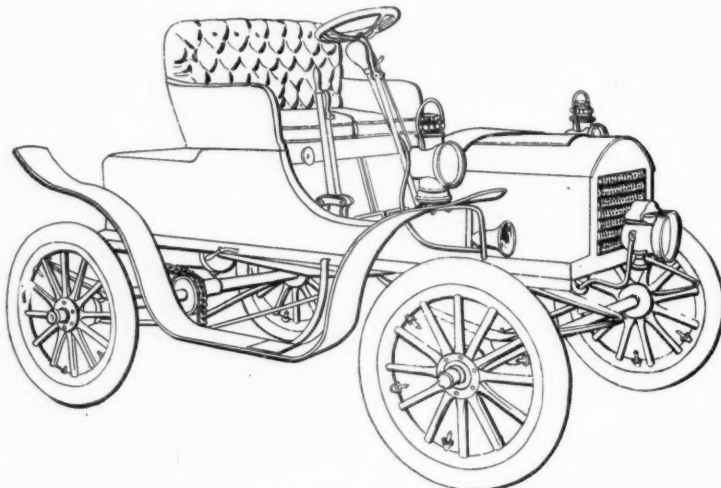


THE WOLVERINE

incased. The car is simple in construction and is stout in all particulars. The wheel steer is the regular equipment of the model B and on the other model either wheel or center lever steer will be provided.

REID MFG. Co.—The Wolverine is a moderate weight tonneau car driven by a 15-horsepower, double opposed horizontal motor placed across the front end of the running gear. The transmission is by a standard form of sliding gear, furnishing three forward speeds and a reverse. The car is fitted with roller bearings throughout. The one particular novelty of the car is the double rear platform, forming a compartment several inches high underneath the tonneau floor. This space is reached through a trap door under the front seat and is useful for carrying extra tires, rain coats, and other luggage.

COVERT MOTOR VEHICLE Co.—The Covert is another of the once extremely small cars which have grown to the proportions of a stout runabout. It is driven by a single-cylinder, vertical air-cooled motor with a water-cooled head. The fly wheels are enclosed. The motor is rated at  $6\frac{1}{2}$  brake horsepower. The motor is placed under a bonnet and driven through a sliding gear transmission which furnishes two forward speeds and a reverse, driving direct on the high speed. The running gear is of angle steel, mounted upon four full elliptical springs. The rear axle is of 2-inch steel tubing with the compensating gear entirely incased. The sliding gear mechanism and final bevel

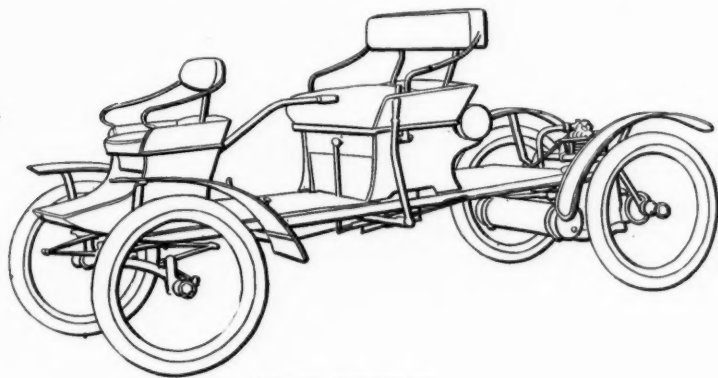


COURIER MODEL B



drive are incased in an extension of the differential case, the connection from the motor being by universal joints and propeller shaft. The front axle is of steel tubing reinforced its entire length by a flat bar of steel. The wheel base is 72 inches and the track 48 inches. The wheels are wood and run on ball bearings. The radiator is of the cellular pattern. There are two brakes, one on the differential and one on the transmission shaft. The latter is so connected that application of it is simultaneous with the release of the clutch. The body is well made and finished, and emulates in miniature the popular king of the Belgians style.

WALTHAM MFG. Co.—The Orient buckboard is of the same general appearance as before, but is larger and has several desirable improvements. First of all, the direct drive has been replaced by a compact two-speed gear. The muffler is larger and more effective and the main driving gear is of fiber instead of metal. The machine thus runs more quietly than did those sold last year. At the rear the frame is supported by a spring instead of being rigidly attached to the rear axle, while full elliptical springs have been placed in front. A spring cushion has been added to the seat back and the seat itself is wider. A regular



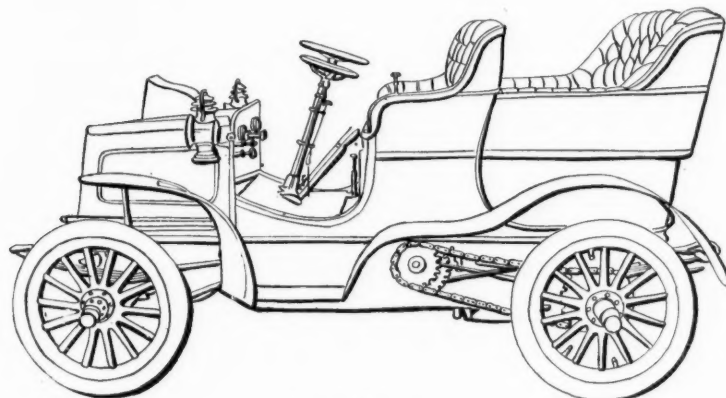
ORIENT BUCKBOARD

motor starting crank replaces the strap device, and the main platform is 2 inches higher from the ground. Aside from the standard pattern, the company shows two machines with useful attachments, one an additional folding front seat and the other a parcel delivery box which is placed back of the driver's seat.

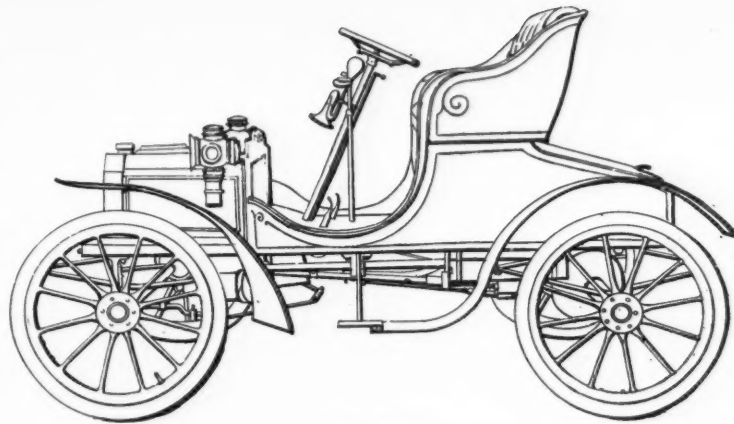
COLDWELL LAWN MOWER Co.—It cuts grass 40 inches at a time and it is propelled by a typical automobile steam boiler and engine, this Coldwell lawn mower. Forming a part of an exhibition of automobiles mainly of the pleasure variety, it is a fetching suggestion of the motor possibilities of the next 5 years. The mower is driven by an 8-horsepower engine and is said to be capable of a speed of 8 miles an hour. The mower has been in use in the park systems of several large cities and as it will do the work of three horse-drawn mowers, it is a practical as well as an anticipatory machine.

DE DION-BOUTON Co. AND KENNETH SKINNER—But one of the popular de Dion cars is shown by the American agent, Mr. Skinner. This is a voiturette having an 8-horsepower motor.

GROUT BROS. AUTOMOBILE Co.—The Grout steamer is shown in a regular touring car pattern of 86-inch wheel base. One of the principal improvements in the steam power plant system over last year is the addition of a condenser. The fuel tank is also larger and the construction as a whole is heavier and the tires larger. The engine is of 10-horsepower and is of two cylinders, which are horizontal. The control is by a throttle regulator on the wheel, which allows the control of the engine to be made without removing the hand from the steering wheel. The boiler is in front under a bonnet, with a special air draft.



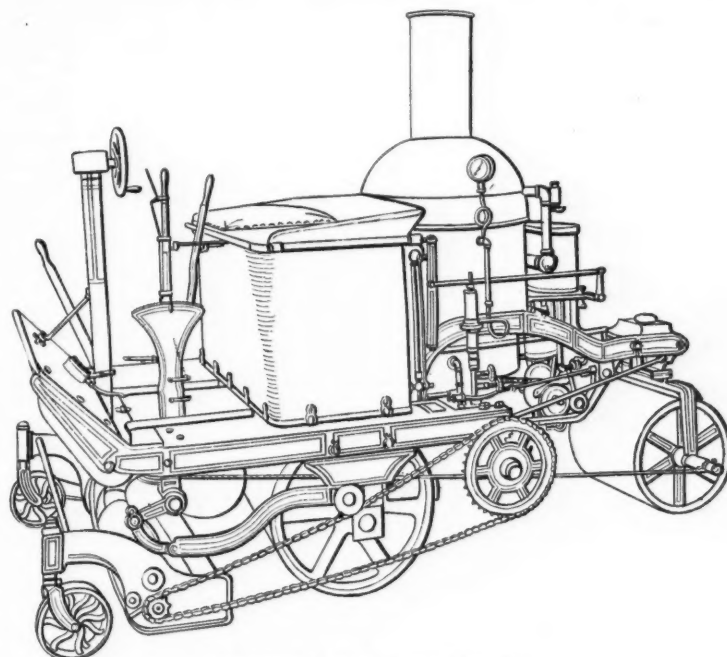
GROUT STEAMER



THE COVERT

Both the boiler and engine are fitted with the approved automatic devices. The boiler is of the regular Grout fire tube pattern. The drive is by chain from the engine to a counter shaft and from the counter shaft to each rear wheel individually.

HOLLEY MOTOR Co.—The little car which the Bradford concern shows has all the earmarks of careful planning and workmanship. The frame is of angle iron, semi-elliptical springs, tubular axle trussed and split. The motor, a single-cylinder Holley, with Holley carburetor, is placed under the bonnet and connects the Upton speed change gear by means of a bevel gear, the transmission to the differential being by means of a chain. The water tank is located just back of the motor and radiator of the coil pipe type is in front, the starting handle being also in front. The gasoline tank is located under the seat. The machine is fitted with a wheel for steering, and

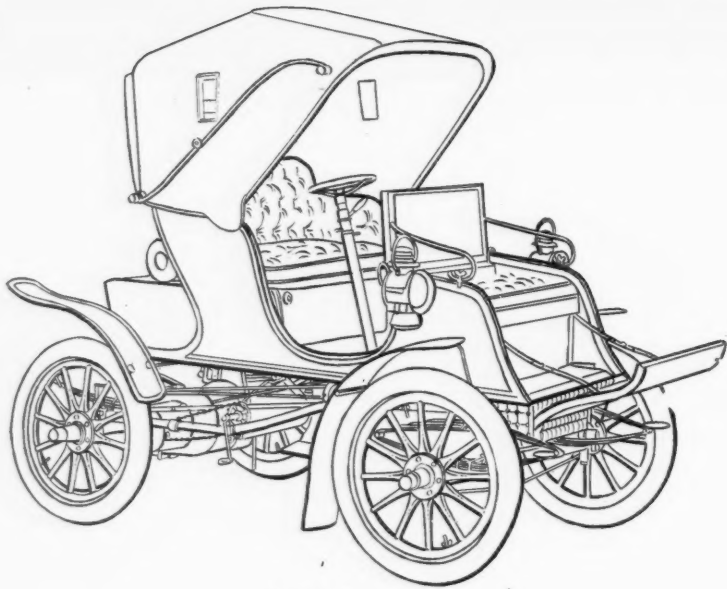


COLDWELL STEAM LAWN MOWER

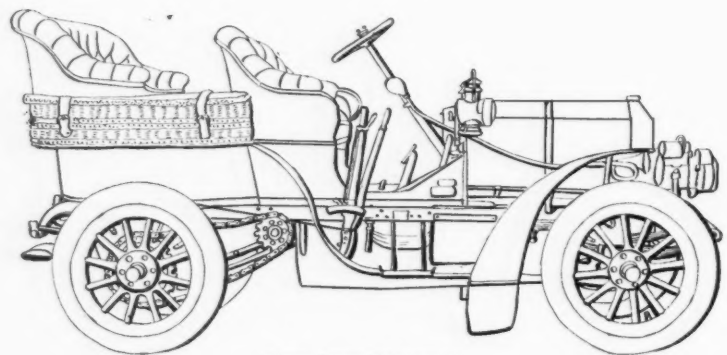
on the steering mast the mixture, spark and throttle control levers are neatly located, with the control lever on the right side. On either side of the steering mast is the foot clutch and brake levers. The wheels are 28 inches and the tread about 40 inches. The workmanship of the chassis is exceedingly good.

STANDARD MOTOR CAR Co.—This firm is the successor to the U. S. Long Distance Automobile Co. and shows a four-cylinder touring car and a six-cylinder marine motor. The car has a pressed steel frame, semi-elliptic springs and 34-inch wheels. The motor is of 4½-inch bore by 5½-inch stroke and is fitted with make and break ignition. There is the usual fan back of the Chelsea cellular radiator, and back of the fan is a partition which prevents the dust from blowing upon the motor, it being forced down underneath the car. There is no tight crank case for the engine, the only protection being a sheet metal pan under the engine and the transmission gear. The engine is started with compressed air. The body of the car is a big one of the king of the Belgians pattern.

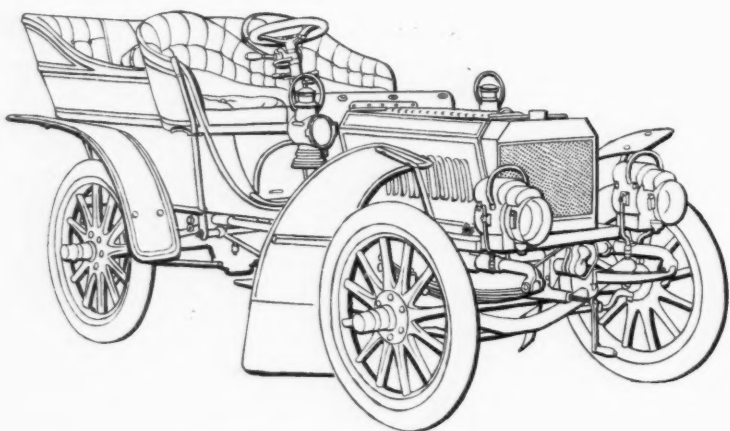
GEORGE N. PIERCE Co.—The Pierce Arrow in two sizes, and the Pierce stanhope are shown. The last named needs little description, being substantially the same as last year. The two-cylinder Arrow is



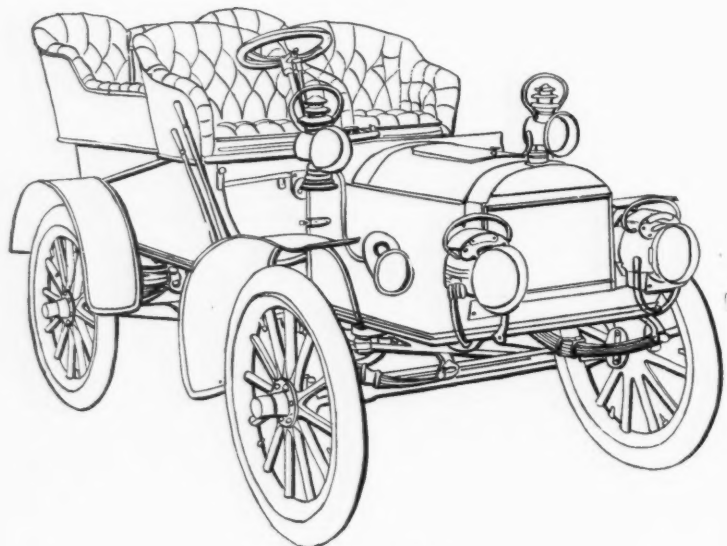
PIERCE STANHOPE



THE POPE-ROBINSON



PIERCE TWO-CYLINDER ARROW

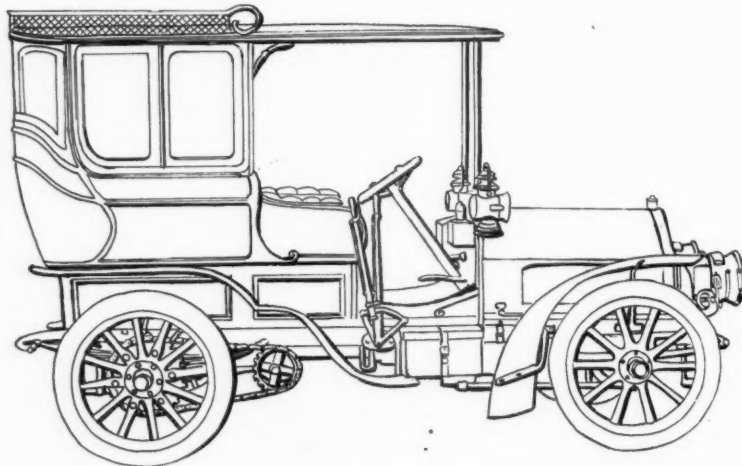


MODEL TOURING CAR

like that used in the endurance run, while the four-cylinder is that described last week in *MOTOR AGE*. In the stanhope the most noticeable improvements are a flat face internal clutch, wheel steering and the optional fitting of a coupe glass top, making the car an especially desirable one for a doctor. The two-cylinder car has the same tubular frame construction and the same general system of power plant and transmission, but the bevel gear drive being retained substantially in the same form. But the bonnet is made square, with a cellular radiator in front and the rear body is of the king of the Belgians pattern. To the motor mechanically operated inlet valves have been added.

J. H. SPRINGER—Exhibits a touring car, fitted with a 12-horsepower horizontal double-cylinder opposed type of motor. The cylinders are 4 by 5 inches. The engine is set lengthwise of the vehicle, under the seat, and connects to a three-speed, sliding gear transmission. From the sprocket on the transmission gear, chain drive is used to a differential on a counter shaft, from which side chains connect the rear wheels. The frame work is of pressed steel. All valves are set vertically and are mechanically operated. Plain bearings are used throughout. Aluminum bodies are exhibited, one being a king of the Belgians pattern, finished in blue and silver. It seats seven passengers.

POPE ROBINSON Co.—New features and improvements since last season are jump spark ignition, sliding gear transmission, larger tires, longer springs, longer wheel base, improved channel steel frame, increased power, aluminum body, right side operation and reduction of weight by about 600 pounds. The wheel base is 96 inches, and the wheels are 34 inches in diameter, with 4½-inch tires. The four-cylinder motor is under a Mercedes pattern bonnet. Its bore and stroke are



SMITH & MABLEY LIMOUSINE

4 and 6 inches respectively, and it runs normally at 750 revolutions. The driving clutch is of the expanding variety and is of large diameter. The sliding gear transmission is not novel, but possesses the typical virtues of safety interlocking devices with the clutch, etc. The body design and equipment renders the car suitable for touring, as it is roomy and comfortable.

MODEL GAS ENGINE Co.—Several weeks ago *MOTOR AGE* described the 12-horsepower Model light tonneau. At that time the car which chiefly characterizes the show display was not ready—a 16-horsepower car of similar general construction, but larger throughout and with a square, oval top bonnet instead of a curved box front. The principal feature of the car is the transmission gear, which furnishes three forward speeds and two reverse speeds through the medium of a simple device in which there is a relatively small number of gears, rolling friction clutches being brought into play in the making of some of the speed changes. The five speeds are obtained by two levers. The final drive is by a single chain. The motor is of the double opposed pattern, of 4½-inch bore and 7-inch stroke. It is said to develop 16 horsepower at 900 revolutions. The valves are mechanically operated.

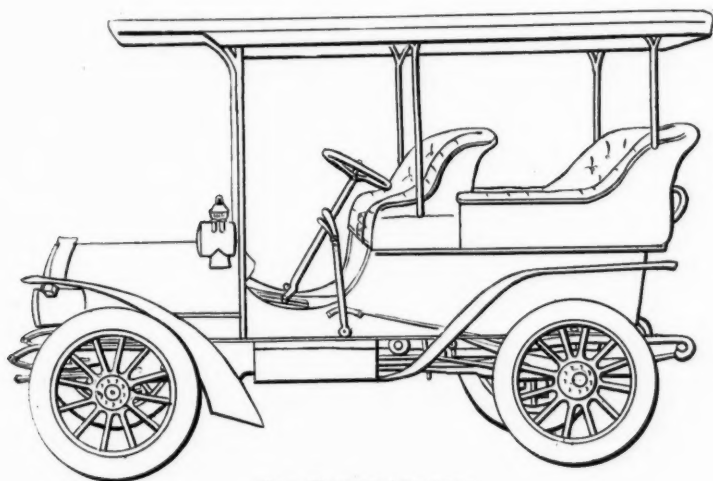
SMITH & MABLEY.—Among the handsome Renaults and other well known French machines exhibited and sold by Smith & Mabley, is an 18-horsepower car of their own construction. This comprises a four-cylinder motor chassis, which weighs complete 2,800 pounds, and which may be equipped with various style bodies, being capable of taking passenger bodies of from two to seven people. The wheel base is 91 inches and the tread 53¼ inches. The frame is 114 inches long with a body space of 35 by 79 inches. The motor is hand and foot throttled and is said to be capable of running from 200 to 1,200 revolutions, its normal speed being 800. The water circulating system includes an up-to-date honeycomb radiator. The carburetor is of the



newly popular form in which the proportion of air and gasoline is supposed to be automatically regulated by the varying speed of the motor.

**HOLLANDER & TANGEMAN.**—The F. I. A. T. is a long, comfortable car, having optional wheel bases of 90 and 114 inches. The frame is of pressed steel, narrowed in front to permit of a wide arc of steering wheel swing. All of the main bearings of the running gear and transmission are ball. The motors are four-cylinder uprights and are in three sizes, ranging from 16 to 60 horsepower. The fuel is supplied through a float feed carburetor under pressure from a special pressure tank under the rear of the chassis. The ignition is of the make and break type, with a magneto furnishing an alternating current. The motor control is entirely by a pedal. The radiator is of the Mercedes style and is cooled by a fan on the periphery of the motor flywheel. The driving clutch is expanding, metal to metal, and the transmission is by sliding gears. There is a brake on the differential and emergency expanding brakes on the rear wheels. A single lever controls the four forward and reverse speed changes. In bodies the purchaser has the choice of four styles seating five people and of larger sizes for six and eight passengers.

**HAYNES-APPERSON Co.**—The king of the Belgians pattern tonneau car is characterized for this year by a longer wheel base, larger radiator and stronger springs than used last season. The frame is of angle iron, with a tubular sub-frame. Artillery wheels are used, which run on roller bearings front and rear. The springs are semi-elliptic. The motor is of the double opposed cylinder pattern, of 5¼-inch bore and 6½-inch stroke. It runs at from 150 to 1,200 revolutions per

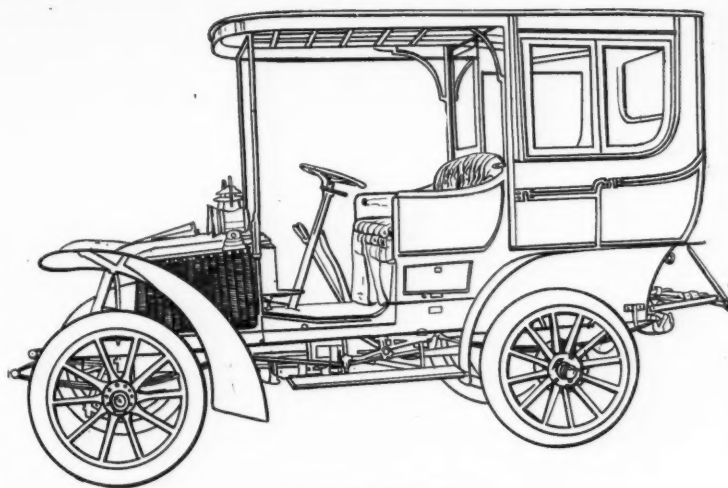


THE HAYNES-APPERSON

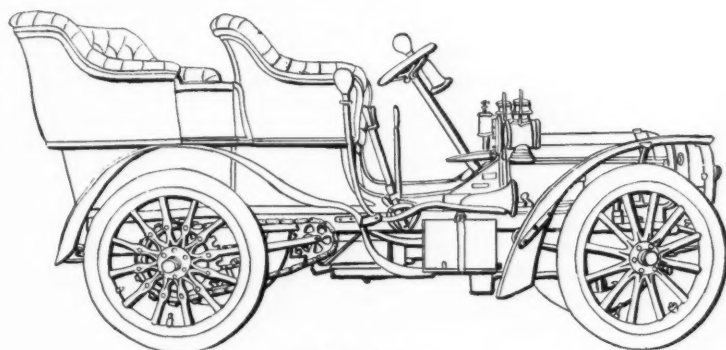
minute. The ignition is by jump spark and batteries. The lubrication feed is by a geared oil pump. The transmission gear is of the form which has characterized all the Haynes-Apperson cars—the spur system with individual clutches furnishing three forward speeds and a reverse drive. Roller bearings are used throughout the machine. A feature of the steering mechanism is the adjustable steering wheel. The company also shows new patterns of its lighter cars, these in construction being chiefly characterized by a longer wheel base, a new style of rear axle and more powerful motors.

**REGAS AUTOMOBILE Co.**—The Regas is shown in two patterns, one with a two and the other with a four-cylinder motor. The construction is similar, the chief peculiarity of each being the system of air cooling of the motor. This is of the oblique cylinder pattern, with the crank shaft longitudinally of the car. Projecting from each cylinder are 172 perforated copper tubes, 1½ inches long by ½-inch in diameter. These tubes not only provide a large radiating surface but are supposed to create an excellent circulation around the cylinder wall, after the principle of operation of the Bunsen burner, it being shown that the passage of the hot air from the tubes draws cold air into them through the perforations. Each tube is flanged to fit the cylinder closely and they are all held in place by a perforated sheet steel jacket. The transmission is of the individual clutch spur gear pattern, with double chain final drive. The body is characterized by a side entrance to the tonneau, formed by making the left forward seat so that it may be tilted downward and forward to allow entrance through the door in the side wall of the tonneau.

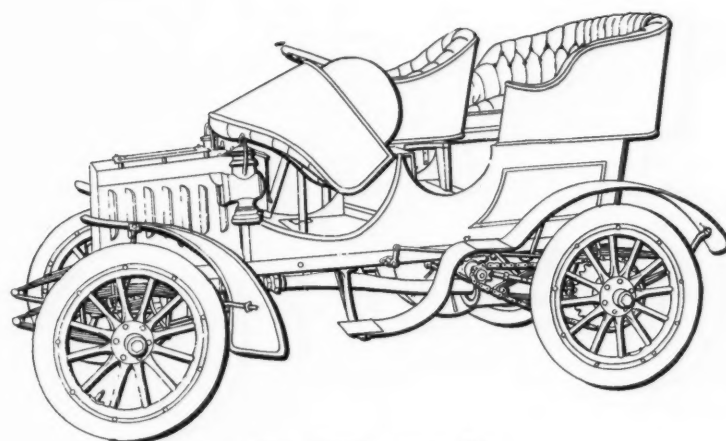
**GEORGES RICHARD-BRAZIER**—This concern is located in the restaurant section, among the other foreigners, and contains a tonneau with top and a larger car with full back seat and side entrances, the only thing of the kind shown in the building. Seats are also arranged on the doors, making a carrying capacity in the back portion for five people.



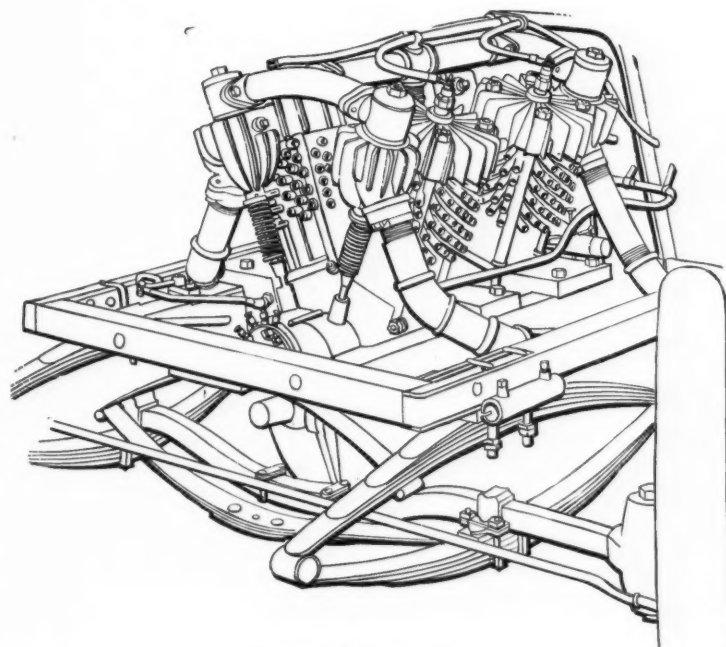
RENAULT LIMOUSINE



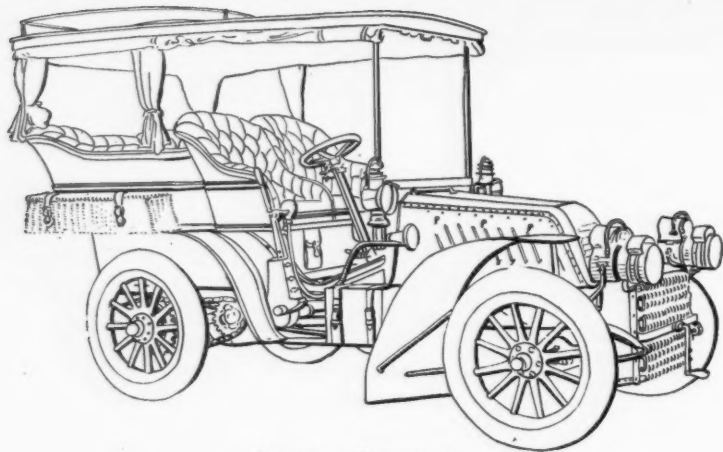
THE F. I. A. T.



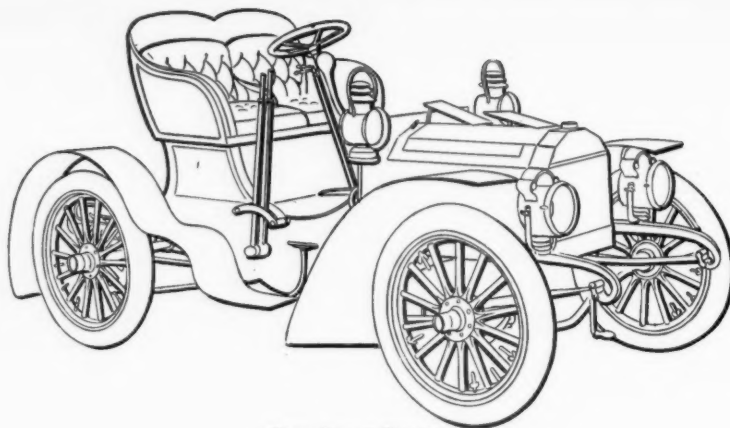
REGAS FOUR-CYLINDER CAR



REGAS AIR-COOLED MOTOR



COLUMBIA TOURING CAR

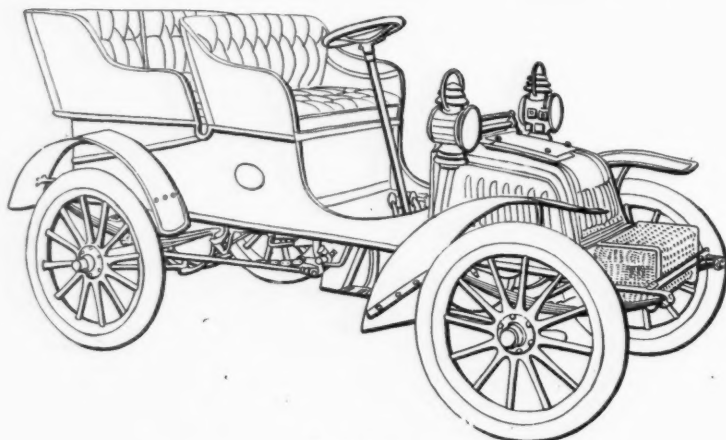


THE JONES-CORBIN

THE ELMORE MFG. CO.—The Elmore for 1904 is substantially the same as that of last year, with the exception that it is fitted with a new carbureter and with jump spark instead of make and break ignition. The principal features of the new carbureter is an adjustable air shutter, whereby the suction of air and gasoline are balanced at different motor speeds. The motor is, of course, the two-cycle motor which has always characterized the Elmore construction. In the newest model the bore is increased  $\frac{1}{2}$ -inch over that of last year's machines. The transmission is that of the planetary system, furnishing two speeds forward and reverse. The toggle joints which actuate the transmission brake bands have so much leeway that they need atten-

tion only at rare intervals. The speed changes are controlled by a side lever. There are three brakes, one on the transmission gear and one on each side of the differential.

speed passes 450 revolutions it is controlled by a governor. Each pair of cylinders has an individual crank case which may be removed without disturbing the other. The inlet valves are mechanically operated from the same cam shaft as the exhaust valves. The carbureter is of the popular style in which the mixture is regulated according to the speed of the motor. The sliding gear transmission set is strong and has the usual interlocking devices to render it impossible to make damaging shifts. The steering gear is a new adaptation of the worm gear device. The car is equipped with either a canopy top or a limousine. Supplementing this car is the new two-cylinder Columbia which was recently described in MOTOR AGE. The electric line consists of a new, extremely light runabout, a victoria, a victoria phaeton, an extension front brougham, a landau, a 2,000-pound capacity delivery wagon, and a delivery wagon chassis that may be adapted to several styles and sizes of commercial bodies.



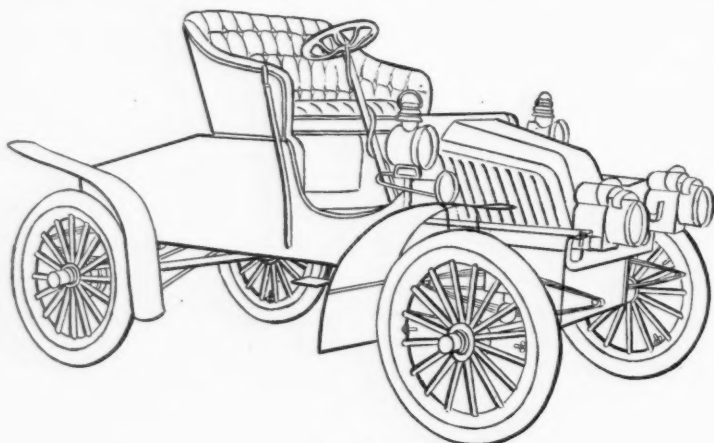
THE ELMORE

JONES-CORBIN AUTOMOBILE CO.—This newly organized company shows the same fetching little single-cylinder upright light car that was made by the previous Jones-Corbin company at the time of its failure. A four-cylinder car of similar design is also made.

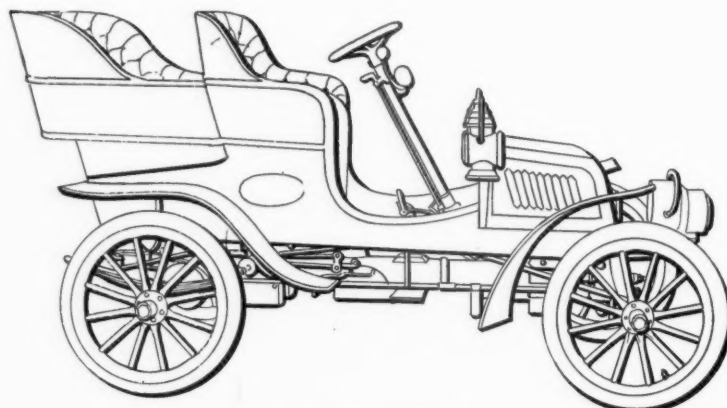
THE FREDONIA MFG. CO.—The Fredonia does not differ greatly from that of last year, being a light touring car driven by a single cylinder, 6 by  $6\frac{1}{2}$ -inch engine, the principal feature of which is the auxiliary exhaust port which is uncovered by the piston at the end of each outward stroke. The running gear is of the channel iron form with full elliptic springs. The wheel base is 84 inches and the wheels 30 inches in diameter. The body may be of the divided seat two passenger style or the same with a tonneau. The transmission is of the two-speed and reverse planetary type, in which the speed changes are made by the same lever and the brake and reverse control by a pedal.

CREST MFG. CO.—The new Crest is exteriorly and in general construction much like the Crestmobile of 1903. It has been made longer and of wider tread and is driven by a more powerful motor. This, as formerly, is a single-cylinder upright placed in front of a conventional bonnet. The vertical radiating ribs have been replaced by annular ribs and the efficiency of the air cooling is enhanced by a belt driven fan. The motor is rated at 8 horsepower. It runs slower than the old Crest motor, and the fly wheels, though still within the crank case, are heavier. The inlet and exhaust valves are mechanically operated. The final drive is by the same system of propeller shaft and bevel gears used in the previous model. The high speed is by direct drive through an expanding ring clutch. The low speed is obtained by

ELECTRIC VEHICLE CO.—Most prominent in the gasoline section of the company's display is the new 30-horsepower, four-cylinder touring car. It is similar to the gasoline touring car of last season, but incorporates several changes made as the result of the season's experience. The wheel base has been increased to 100 inches and the wheels are 34 inches in diameter. A pressed steel frame is another change and upon it the foot board and dash are mounted rigidly, being entirely distinct from the body. The bore and stroke of the motor is 5 inches and the normal speed between 800 and 900 revolutions. When the

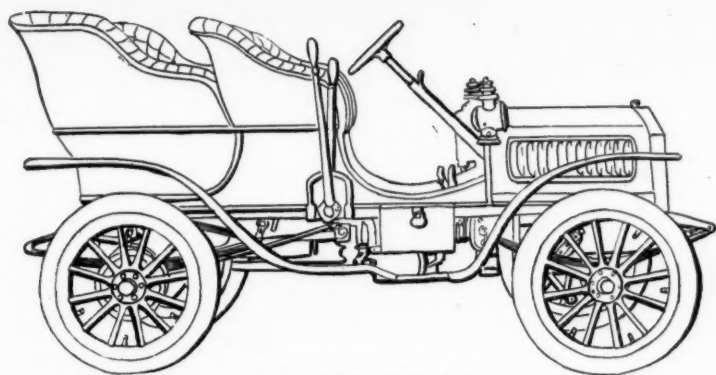


THE FREDONIA



THE CRESTMOBILE





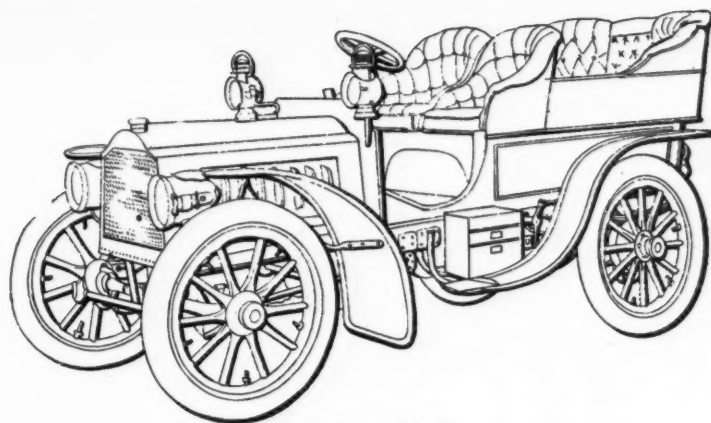
NATIONAL GASOLINE CAR

a friction band controlling a set of reducing gears. The reverse is obtained through a planetary gear system. As formerly, the whole power plant and transmission gearing is supported upon the running gear independently of the body, the latter being suspended on two elliptical rear springs and an X front spring.

**NATIONAL MOTOR VEHICLE Co.**—The star of the exhibit is the new gasoline car. This is a 24-horsepower touring car of approved lines—oval top bonnet, pressed steel frame, etc. The axles are tubular and are 86 inches apart. The wheels are 30 inches in diameter. The frame is supported by 40-inch half-elliptic springs in front, and by full elliptics of the same length in the rear. The motor is of four cylinders of  $3\frac{3}{4}$  by 4 inches, individually mounted on an aluminum crank case. The inlet valves are mechanically operated. The ignition is by jump spark with quadruple vibrator coil and commutator on the dash board. The driving clutch is of the self-contained cone variety, and the transmission is by a simple three-speed sliding gear set. The final drive is through a propeller shaft and bevel gears. Application of either the transmission or rear wheel brakes disengages the clutch. In changing speeds by means of the side lever the clutch is released automatically. The water cooling system includes a cellular radiator with forced draft fan. Six electric carriages are also shown. One of these, the largest, is especially built for equipment with the Edison battery, if desired.

**STANDARD AUTOMOBILE Co.**—All of the Decaullies are alike so far as chassis construction is concerned, and each is, accordingly, chiefly characterized by the pressed steel frame which includes a pressed steel pan underneath the front half, this pan forming at once the support for the motor and transmission gear and a dust proof casing for all of the running parts. The lower half of the motor crank case and that of the transmission case are of aluminum, and formed of one casting, which sets into the pressed plate and is rigidly attached to it. All of the chassis but one have four-cylinder motors which are typical of modern French construction, having mechanically operated inlet valves, throttle governor, enclosed commutator, etc. The final drive of all models but one is by propeller shaft and bevel gears. The exception is the 40-horsepower car, which has double side chain drive. Each of the six sizes of chassis may be fitted with different patterns of bodies.

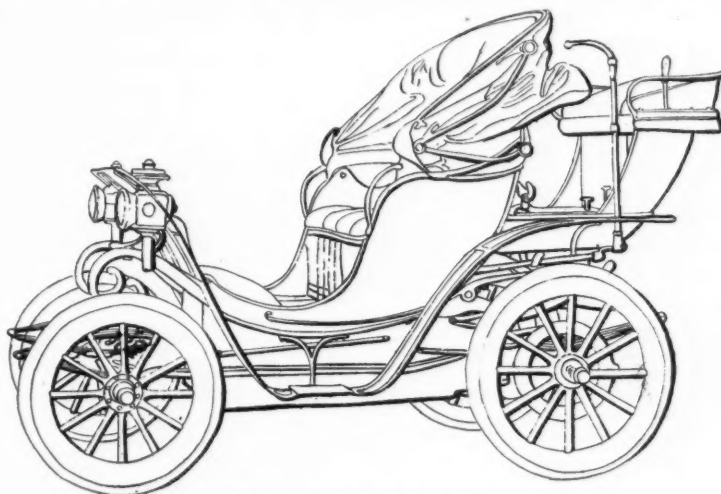
**PACKARD MOTOR CAR Co.**—The exhibit comprises two radically distinct styles of cars, one of the model F Packard, the good old, reliable, single-cylinder boy that made the Packard reputation and which ran from San Francisco to New York last summer under the guidance of Tom Fetch. This is not changed in essential features for 1904. The other type of construction is illustrated in somewhat different manners by models L and K and the Gray Wolf. All have four-cylinder vertical motors in front. The model L is substantially the Gray Wolf with road body and equipment. It has the same pressed steel frame, 22-horsepower motor and sliding gear transmission contained in the rear axle. The motor is of  $3\frac{7}{8}$ -inch bore by  $5\frac{1}{8}$ -inch stroke, with the cylinders cast in pairs. The clutch is of the expanding type within the fly wheel. The whole transmission from the motor to the



PACKARD MODEL L

rear axle runs on ball bearings. There are four band brakes all located upon the driving wheel drums. There is no brake on the engine transmission or differential. The wheels are 34 inches in diameter, and the suspension is of the well known style of three semi-elliptical springs, in which the front spring is placed cross wise of the vehicle above the front axle. The model K has a sliding gear transmission under the body and a final drive secured through a propeller shaft with universal joints. The wheel base is extremely long and the wheels are 36 inches in diameter. This is the chief aristocrat of the Packard family and will be equipped with any kind of body desired by the customer. The Gray Wolf needs no explanation, its chief excuse for existence being a kilometer in 29 2-5 seconds and a mile in 46 2-5 seconds.

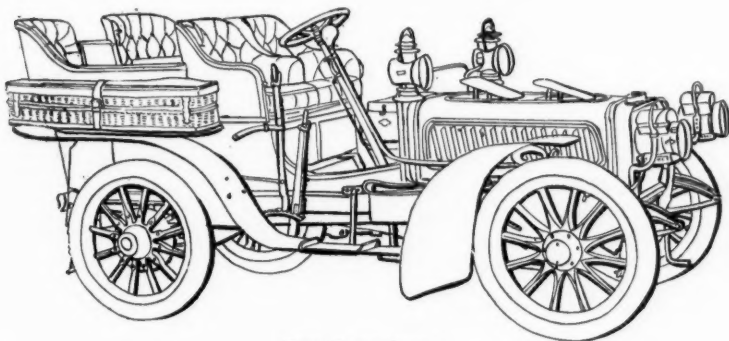
**SPRINGFIELD AUTOMOBILE Co.**—The one Springfield car which is shown is made with laminated wood frame and has a 72-inch wheel base and 54-inch tread. Thirty-four-inch semi-elliptic springs are used in



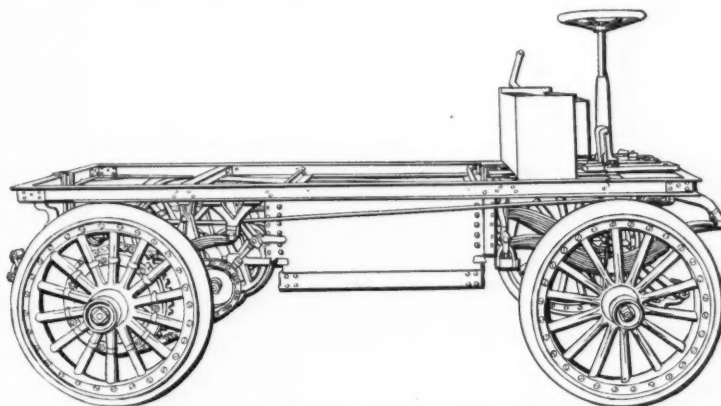
COLUMBIA VICTORIA PHAETON

front and full elliptic 36-inch in the back. The car is fitted with what is claimed to be an irreversible wheel, steering through a Brown-Lipe gear. The body is made of wood, with high back tonneau. The motor is of the horizontal type, 8 horsepower, the cooling being by pump and a 14-tube radiator. The transmission gives direct drive on the high speed. Lubrication is automatic and the motor is governed by both the spark and throttle.

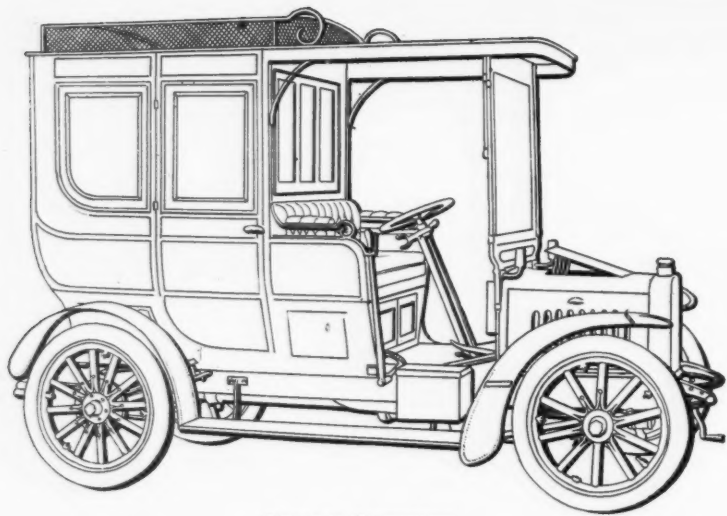
**F. A. LA ROCHE & Co.**—The American agent for the Darracq shows the popular French car in its latest patterns, the four-cylinder model being the leader. High finish of working parts, as well as body, is



THE DECAULLIE



COLUMBIA ELECTRIC DELIVERY CHASSIS

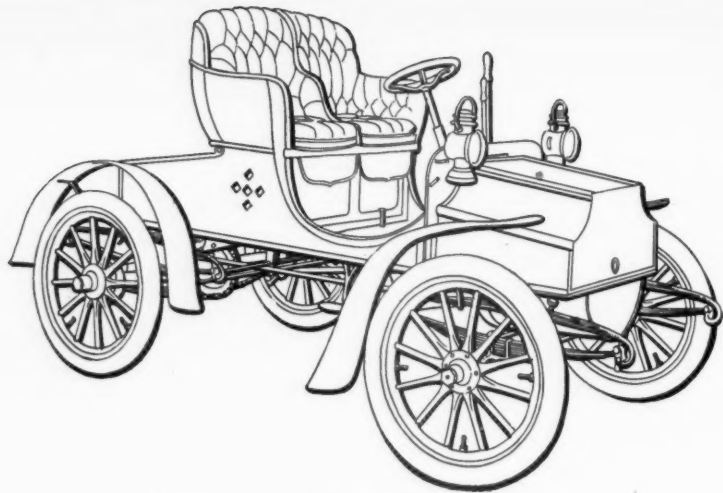


DARRACQ LIMOUSINE

one of the features, while the chief constructional change since last season is the addition to the pressed steel frame of a sheet steel bottom web to form a tight fitting support for the motor crank box and the transmission gear case.

RODGERS & Co.—The Imperial is another addition to the ranks of the air-coolers. It is of the stout runabout pattern, with the chassis rigged either as a runabout, doctor's wagon or delivery wagon. The motor is a double-cylinder horizontal placed across the front under a peculiar hood. The air cooling property of the regular copper ribs is enhanced by a fan, while a ventilator on the crank case provides for the alternate drawing in and expulsion of air to cool that part of the motor. The transmission is by sliding gears and propeller shaft, with bevel gear final drive. The springs are long, the makers, as old carriage builders, having been consistent to their trade in building for comfort as well as efficiency. The car is equipped with 30-inch Midgley wheels.

THE E. R. THOMAS MOTOR Co.—This exhibit is one of the surprises of the show. The Thomas company having been known so extensively as the builder of light tonneau cars, naturally created somewhat of a sensation in the trade when it sprung upon it a full-fledged touring car of 24 horsepower and of essentially modern construction. This new car was fully described in MOTOR AGE a few weeks ago. Briefly, its chief characteristic is a three-cylinder vertical motor. This style of construction was chosen after a careful mechanical research, both in America and abroad, the Thomas company having come to the conclusion that the three-cylinder motor is bound to be popularized. The construction of the entire machine is stout, and particular attention has been paid to the support of driving members and to the support and rigidity of bearing supports, that there may be no inter-acting strains in the various propelling elements. The transmission gear is of the sliding gear pattern driven by a self-contained fly wheel clutch, and driving, through bevel gears, a cross counter shaft from which two side chains extend to the rear wheels. The principal feature of the transmission is the sliding gear device whereby, when the direct or higher speed engagement is made, all of the secondary shaft gears are thrown out of mesh to prevent the running of idle gears. The clutch and back levers are so interlocked that when either the emergency brake or the pedal brake is applied, the clutch is simultaneously released. The body is stylish, with the approved motor bonnet. Supplementing the regular body, however, is a covered body which is called the Thomasine, being somewhat on the limousine order. The four sides of the tonneau may be closed or the glass sides may be folded upward to form an open canopy top car. The Thomas company also

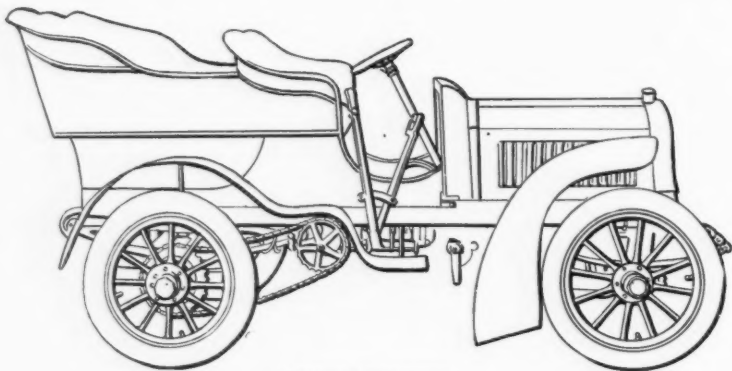


THE IMPERIAL

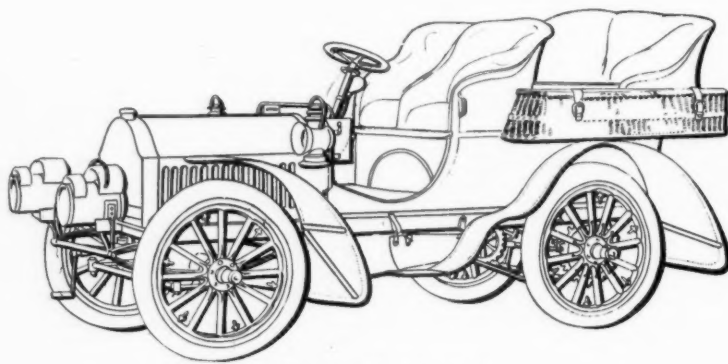
shows its new motor bicycle, which is driven by a 3-horsepower motor mounted in line with the seat mast as formerly. It is provided with a new carbureter and with a new system of handle bar control. The frame is of the same truss spring fork and cushion rear frame construction, which has proven entirely successful. The rear wheel is driven by the Thomas combination steel and leather belt which was devised to combine the good features of chain and belt transmission.

THE LOCOMOBILE Co. OF AMERICA.—The 16 to 22-horsepower touring car is the center of the display, which also includes a two-cylinder gasoline car and a full line of Locomobile steamers. The principal improvements in the four-cylinder car over the corresponding pattern of last year are longer springs and wheel base and larger tires; foot throttle in addition to hand throttle; ignition batteries charged from a dynamo, and a new commutator, new coil and new vibrator. The kerosene hand pump used last year for the purpose of cleaning the cylinders has been discarded, in favor of the ordinary method of injecting kerosene through the compression cocks. The car has a channel steel frame cut to angle form at the ends. The side bars are rivetless. The springs are semi-elliptical, the rear ones being 44 inches long. All the wheel bearings are plain. The axles are solid forgings. The cylinders are 4 by 5 inches and the motor runs at normal high speed of 900 revolutions. The crank case is of bronze. The cylinders are cast in pairs with continuous water jackets. The inlet valves are automatic, the ignition is by jump spark with the current furnished by the batteries, of which there are four cells equipped with automatic switches for recharging from the dynamo. The governor acts upon the throttle. The radiator is of the cellular pattern. The driving clutch is of the self-contained, conical pattern and the sliding gear set is in a bronze casing. The gears are all of steel. All of the essential elements of the transmission are incased. The final drive is by double chain from a cross counter shaft support by universal joints. The cars are finished in several styles, the company keeping different patterns on hand in gray, ready to finish upon order. The two-cylinder car is much the same throughout as the larger car, with the exception that it does not have the dynamo for recharging batteries.

DURYEA POWER Co.—This is the same old Duryea with which the trade is so familiar and which is so typical of its constructor, Charles E. Duryea. The same three-cylinder inclined motor with the transmission gear and all essential factors of the power plant arranged in a compact group over the rear axle, is retained, as is also the general form of the phaeton. To this body, however, there has been added a folding rear seat. Changes for the new season are an improved muffler, a more flexible front running gear, longer springs, natural and

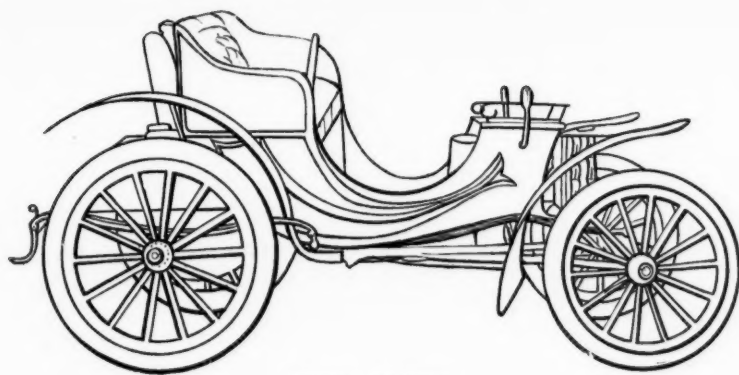


THOMAS "FLYER"

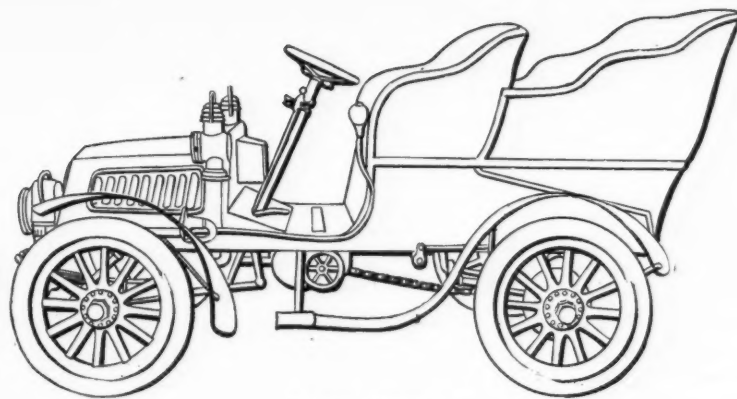


FOUR-CYLINDER LOCOMOBILE





DURYEA PHAETON



DAWSON TONNEAU

pump water circulation with radiator, and either jump spark or make and break ignition. The car comprises a wood body with an iron frame which supports the power plant, and a tubular subframe in front for the attachment of front wheels. Semi-elliptical rear and one-quarter elliptical front springs are used. The rear wheels are 36 and the front wheels 30 inches in diameter. The wheel base is 81 inches and the tread standard. The bore and stroke of the motor is  $4\frac{1}{2}$  inches and the three cylinders running at 1,000 revolutions a minute are rated at 12 horsepower. The chief peculiarity of the motor construction is the screwed-in cylinder head, probably the only head of its kind at the show. The transmission is the regular Duryea planetary system. The control is also well known, being the one hand system in which the steering, the throttle regulation and the high and low speeds are accomplished by the manipulation of one lever.

NORTHERN MFG. Co.—The Northern is another builder of runabouts to come to the front this season with a touring car. This is made on conventional lines but is light, weighing but 1,500 pounds. The motor is of  $4\frac{1}{2}$ -inch bore and stroke. The entire transmission gearing is mounted in the motor crank case. The final drive is by bevel gear and propeller shaft, which is arranged in a peculiar manner to avoid the use of universal joints. A feature of the braking system is the self-locking pedals, which may be set and the foot lifted without releasing the brakes. The wheel base is 84 inches and the wheels 30 inches in diameter, fitted with  $3\frac{1}{2}$ -inch tires.

EISENHUTH HORSELESS VEHICLE Co.—This company shows the compound gasoline car which was developed and brought out by the Graham-Fox Motor Co. Its chief peculiarity is, of course, the compound gasoline engine with two four-cycle, high pressure cylinders, and a low pressure two-cycle cylinder between them. The motor is connected directly to the transmission gear box by universal couplings, and the clutch is within the gear box that it may run in oil. The differential on the cross counter shaft is also in the casing. There is but one side lever, which is used to apply the emergency brake. The speed changes are made by a wheel under the steering wheel. The running gear is of the channel iron style in which the channel is formed by side plates and angle irons. The wheel base is 112 inches. The wheels are 36 inches in diameter and fitted with 5-inch tires. The high pressure cylinders are of  $7\frac{1}{2}$ -inch bore and 6-inch stroke. The construction of the cylinder heads and valve chambers is somewhat peculiar owing to the requirements of compounding. The valves are flat seated. Two spark plugs are used in each high pressure cylinder to give quick ignition. The clutch is made of two metals and is in the form of a drum into which shoes expand. The faces are not smooth, as ordinarily, but are in the form of saw teeth, giving a large area. The exhaust from the high pressure cylinders, through the low pressure cylinder to the muffler, reduces it to about 25 pounds pressure at the entrance of the

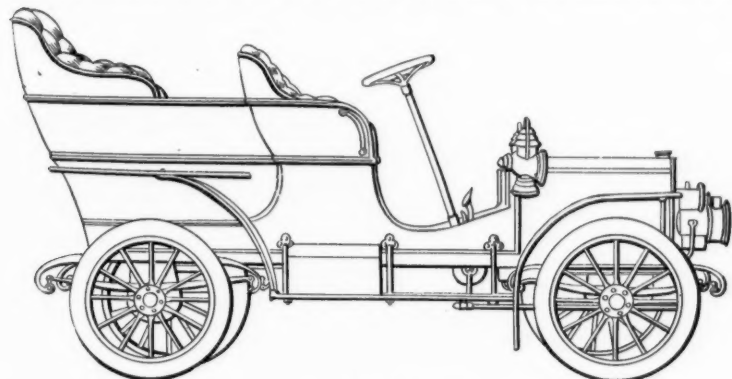
latter. The muffler is therefore simple and not liable to create back pressure. The car throughout presents many interesting departures from ordinary construction.

AUTO IMPORT Co.—This concern, which is an agent for the Rochet-Schneider machine, exhibits in the basement one of the foreign cars, a description of which appears elsewhere.

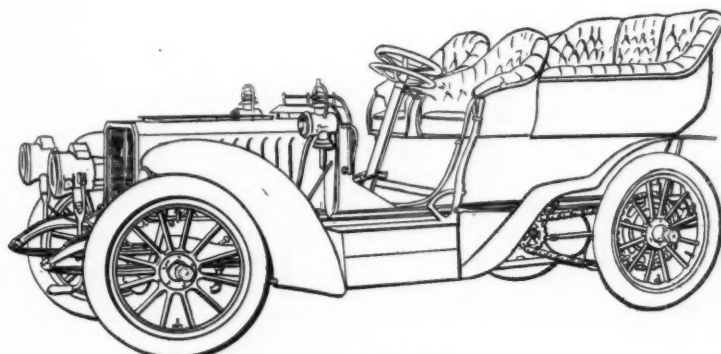
J. H. DAWSON MACHINERY Co.—The Dawson car is a new one from the west, introduced this year after extensive experiment quietly carried on by the maker. It was described recently in MOTOR AGE. It is of the light tonneau order, driven by a 15-horsepower, two-cylinder vertical motor. This has mechanically operated inlet valves placed upon the same side of the cylinders as the exhaust valves and operated by the same cam shaft. The motor, instead of being placed with the shaft longitudinally of the car as in ordinary construction, is placed crosswise and drives the transmission gear with a chain, the gear also being crosswise of the car. The speed changes are made through individual clutches while the reverse is through a small sliding pinion through the secondary shaft. The final drive is by chain to a live rear axle.

JOHN WANAMAKER—At the last moment Manager W. D. Gash secured space in the basement and shows a full line of Ford cars, for which this house is New York agent.

THOMAS B. JEFFERY & Co.—The Rambler line comprises eight models, two of which are substantially the same as the Rambler of last year. The other six models consist of two chassis, upon each of which are fitted three distinct styles of bodies. Both running gears are of substantially the same style of construction, the difference being that one has a single-cylinder motor while the other has a double-cylinder motor. Both are comparatively long, the single-cylinder car having a wheel base of 81 inches and the other a wheel base of 84 inches. The springs are longer and heavier than formerly and the axles are larger. The single-cylinder engine is larger and of higher compression than the engine used last year. The double-cylinder engine uses the same cylinders with a double crank case, the cylinders being cast separately and bolted to the case. Each cylinder is 5 by 6 inches and is rated at 7 brake horsepower. The carbureters are the same as last year. There is a carbureter for each cylinder on the large machine. The Rambler automatic ignition governor is retained. The ignition is by jump spark with two sets of dry cells. The mechanism is simple and conventional. The motor cooling system is of the well known Rambler thermo-syphon, but the combined tank and radiator has been placed in front and is somewhat on the honeycomb order, being comprised of a nest of 370 brass tubes soldered closely together between head plates. The transmission in each machine is of the planetary style as heretofore used. The gear for the two-cylinder car is much heavier, however. The rear axle is live and is driven by a single chain.



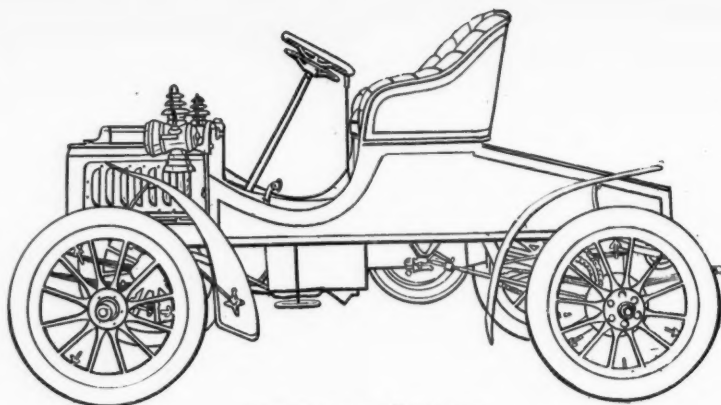
THE COMPOUND



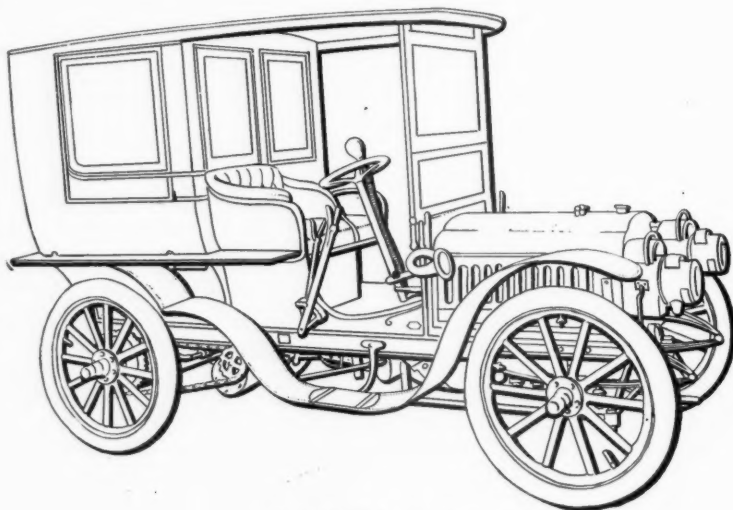
THE NORTHERN

It rotates within a 2½-inch tube which supports the differential through a large yoke. There are two brakes, one on the transmission and the other on the rear wheel drums. The brakes this year are of the expanding pattern. Wheel steering has been added to all of the new models and upon the steering post is a skeleton wheel beneath the regular head wheel. Tipping this regulates the throttle. The speed changes are obtained through a hand lever, while the transmission, brake and reverse are obtained by pedals. The body designs are typical. The single-cylinder model is fitted with a single seat body to which may be added a roomy tonneau or a delivery body. The double-cylinder chassis has a single seat body to which may be added a tonneau or a tonneau with canopy top and glass front.

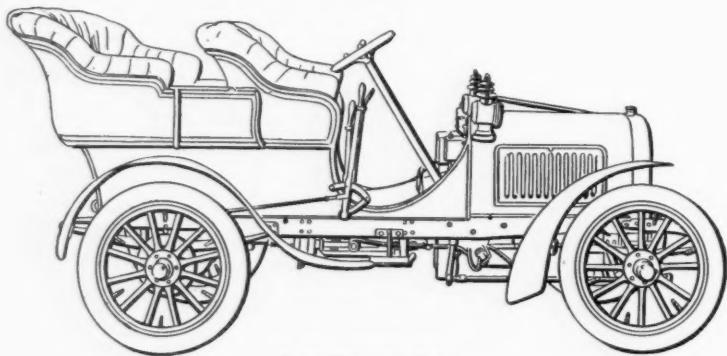
H. H. BUFFUM Co.—Two of the three models made by this company are on exhibition, the absent member being an eight-cylinder, opposed type racing car, rated at 80 horsepower. The model H is the four-cylinder car. The frame is of composite construction, each side having three parts, two of steel and the other of wood. The sides are made wide in section and taper at each end to form a truss, turning at the back to right angles and being riveted to steel cross angles with forged gooseneck spring hangers. The front ends are curved to take spring mounting lugs. The wheel base is 94½ inches, with semi-elliptical springs. The motor is 4½ by 5½ inches, the cylinders being separate on an aluminum base. The valves are mechanically operated, all being alike, and the two valve chambers on opposite sides. The valves are operated by two half-time cam shafts, located in separate compartments on either side of the case. Both jump and make and break ignition are fitted, being in no way connected other than as to control, which is by one lever from the seat. Both batteries and magneto are fitted. The governing device is located on the shaft which runs the magneto and is of the accelerator type, working direct on the throttle. The



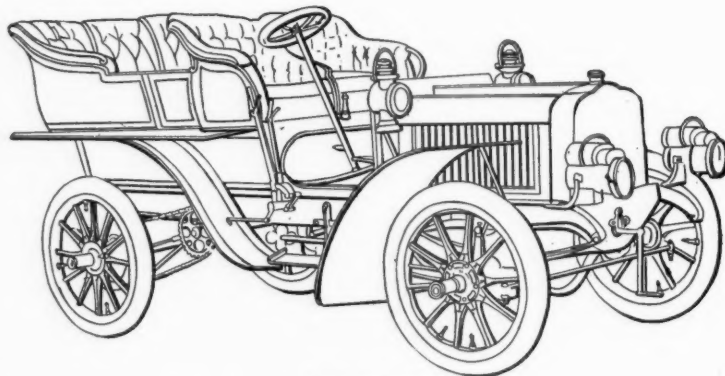
THE RAMBLER RUNABOUT



THE MORS LIMOUSINE



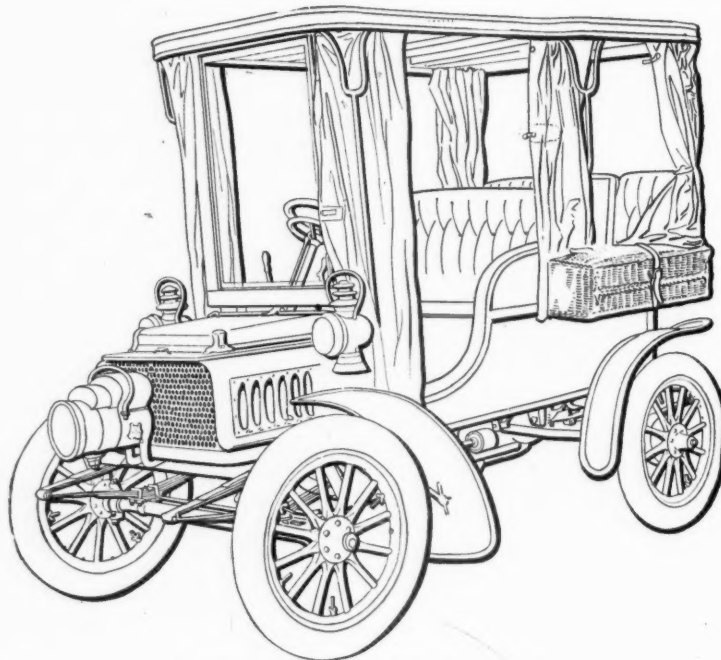
THE WALTER CAR



THE BUFFUM

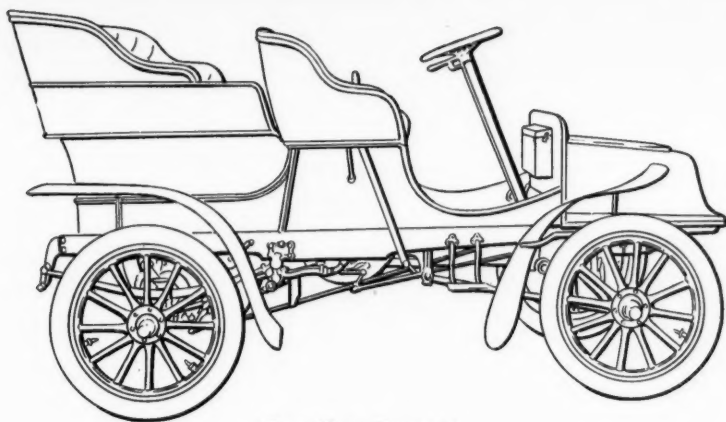
transmission is of the sliding gear type, with three speeds forward and one reverse. The gear case has three parts, the center one being the spider, to which all the gears are attached, while the top and bottom are covers only and may be removed at will. The gear is operated by one lever, which locks the clutch out while the gears are being thrown and prevents the gears being operated until the clutch is released. The model E car has four cylinders of the opposed type, 3¾ by 4¾ inches, placed under the bonnet, the cylinders being longitudinally set. The bodies of the Buffum cars are of aluminum, being pressed in place instead of riveted. While nothing in the marine line was shown the company is making automobile boats and fitting the regular automobile motors therein.

WALTER CAR Co.—The exhibitor shows one completed touring car, with tonneau, and one chassis. The touring car is of medium size, built on modern lines. The chassis is composed of pressed steel frame and braces, the motor and speed changing gear being carried on a supplementary frame suspended from the side reaches. The motor is of the four-cylinder vertical pattern, each cylinder being separate. The valves are located in the heads of the cylinders, each being mechanically operated. Two cam shafts are used, one on each side, both being enclosed in the crank case and oiled therefrom. The valves are operated by horizontal levers, pivoted in the center and supported by lugs projecting from the cylinders, the levers in turn being actuated by vertical rods, which are mounted directly beneath the outer ends of the horizontal levers. The vertical rods are operated by cams in the usual manner. The cylinders are 4½ by 9 inches. The power is stated to be 30 horsepower. The speed of the engine is controlled by the steering wheel and is governed by the lift of the intake valves; the cams are tapered, the variation being such as to allow of the valves being opened to the fullest extent or not at all. The cam shaft is movable, longitudinally with the engine, the movement being secured by a series of levers connected to the control lever at the base of the steering post. A cone friction clutch of usual pattern is used

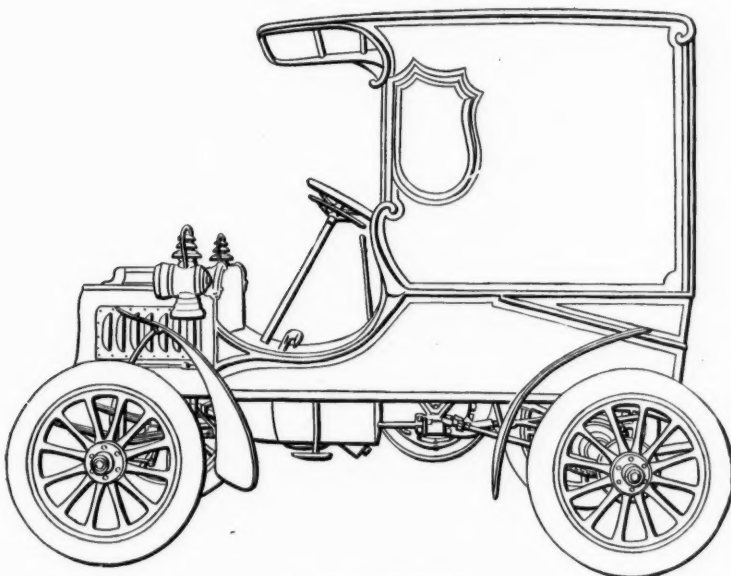


RAMBLER CANOPY TOP TOURING CAR

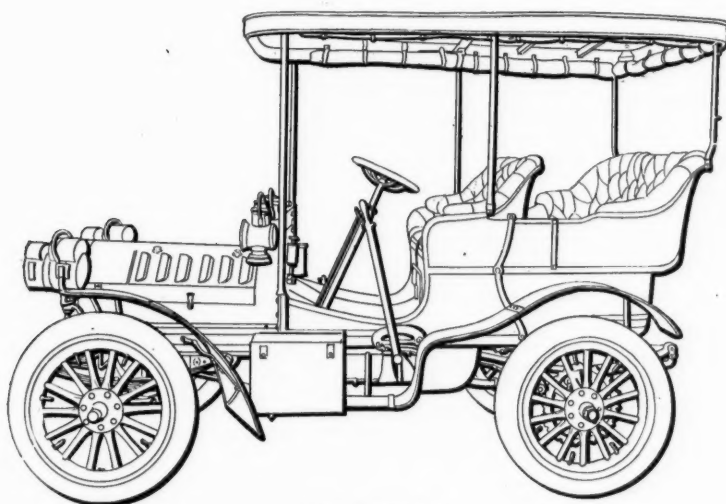




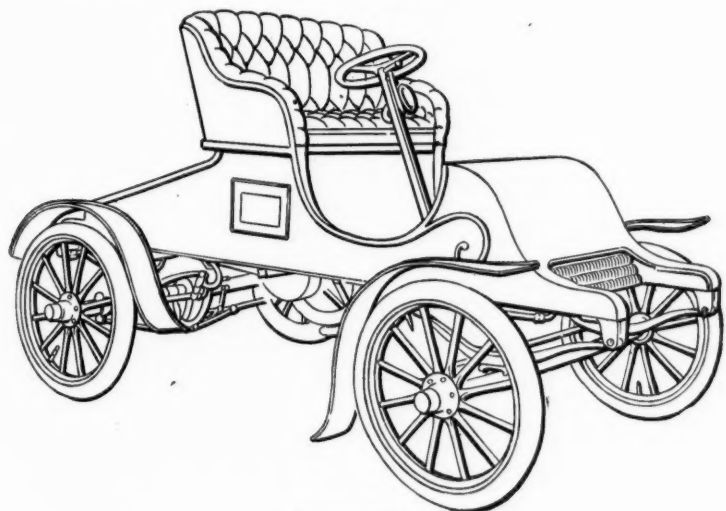
THE NEW CADILLAC



RAMBLER DELIVERY



THE BEVERLEY

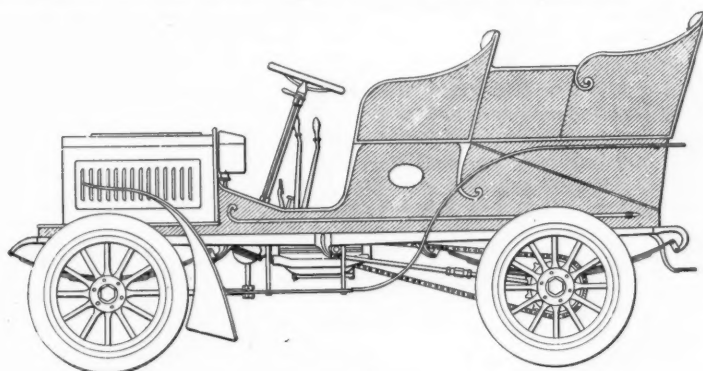


QUEEN RUNABOUT

to connect the engine with the speed changing gear, the latter being provided with three speeds forward and one reverse. From the transmission gear shaft to the bevel gear shaft, the latter projecting from the casing around the differential gear on the rear axle, connection is made by a heavy steel spring spirally mounted around the ends of both shafts, but connected at each end so that as the transmission shaft revolves the spring relieves the sudden jar and transmits the power gradually to the rear axle. The spring is connected, at its rear end, to a coupling so made as to serve the purpose of a universal joint. A double set of brakes are provided.

COLUMBUS MOTOR VEHICLE Co.—The Santos-Dumont of this show is about as different from that shown at the last show as one car would be from another in general principle of construction, for instead of being a light tonneau car driven by a double-cylinder horizontal motor under the body, it is a fairly large touring car propelled by a 20-horsepower four-cylinder, air-cooled motor placed across the front, under a square bonnet. The frame is of angle steel with 45-inch rear and 42-inch front springs. The motor cylinders are of  $3\frac{7}{8}$ -inch bore and  $4\frac{1}{4}$ -inch stroke. The ribs are cast on the cylinders and it is said that they all together provide 2,600 square inches of radiating surface. All valves are mechanically operated. The transmission is through spur gears with individual expanding clutches. The final drive is by roller chains. The brakes are of the expanding variety, a system which, incidentally, seems to be gaining considerable headway in the trade.

CADILLAC AUTOMOBILE Co.—In addition to model A, which is similar to the Cadillac of 1903, is a new and bigger car of the light touring car order. It has a pressed steel frame, semi-elliptical springs, 30-inch wheels, 74-inch wheel base, pressed steel front axle and three-spring suspension. It is driven by a single-cylinder, horizontal motor of 5-inch bore and stroke said to develop  $8\frac{1}{2}$  horsepower at 1,280 revolutions. It has copper water jacket attached without gaskets or

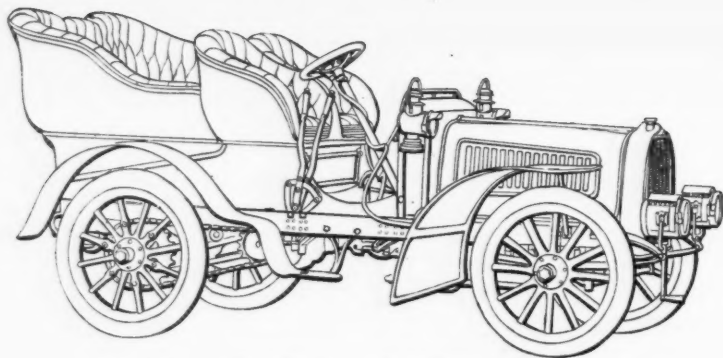


SANTOS-DUMONT

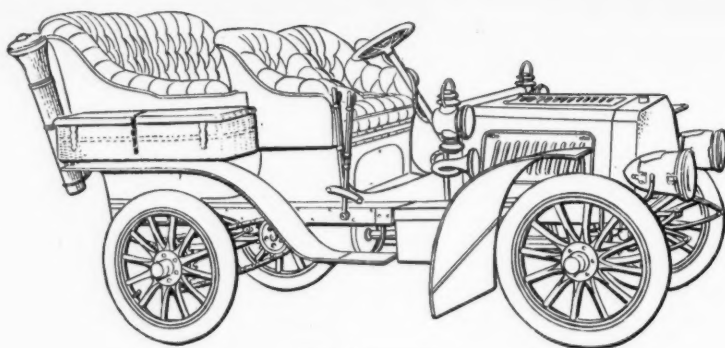
lead joints. The valve chamber is separate from the cylinder. Both valves are mechanically operated and the inlet valve has a variable stroke by which the motor speed may be controlled. The same system of double plug ignition which was a feature of the last year car is used. The main shaft and crank pin bearings may be removed without removing the crank or connecting rod. The transmission is by an incased planetary system in which all parts revolve with the motor shaft on the high speed. Only one gear is attached to the motor shaft and no gear can run faster than it. A twenty-one tooth steel gear is the smallest gear in the set. The transmission can be entirely removed without removing the engine or crank shaft. The steering is by wheel with rack and pinion connections. There is an adjustment between the pinion and rack. No parts of the power plant transmission or principal controlling mediums are attached to the body, all being self-contained on the running gear. The body can be removed by simply sliding it off backward. This machine is fitted out as a runabout, a tonneau, a surrey or a delivery wagon.

A. H. BLOMSTROM MOTOR Co.—The Queen is a runabout of the 1,200-pound class, driven by a  $5\frac{1}{2}$  by 6-inch single-cylinder motor, placed horizontally under the body. The transmission is through a two-speed forward and reverse planetary gear on the extension of the motor shaft. The general construction of the chassis is conventional. Either wood or wire wheels will be supplied, and if desired a two-cylinder motor consisting of two of the regular cylinders placed upon a special crank case will be substituted for the regular single-cylinder motor.

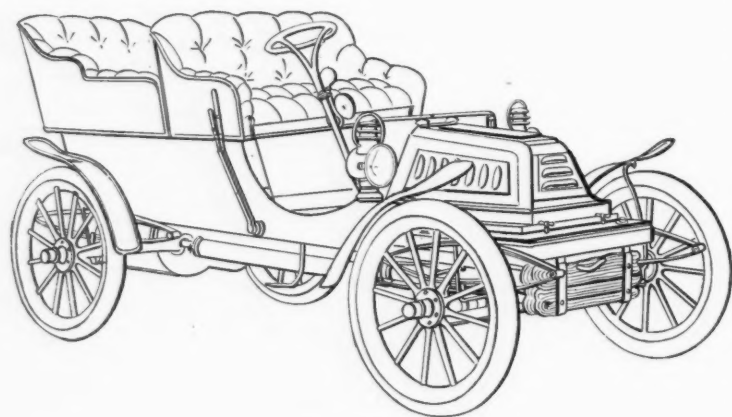
UPTON MACHINE Co.—In addition to the line of planetary gear transmissions shown by this company, a large touring car is also shown. The machine was hurriedly built in order to be on hand at the show, but for all that is a splendid specimen of work. The motor is rated at 24 horsepower, the four cylinders being 4 by  $4\frac{1}{2}$  inches vertical. An auxiliary shaft running longitudinally with the motor is



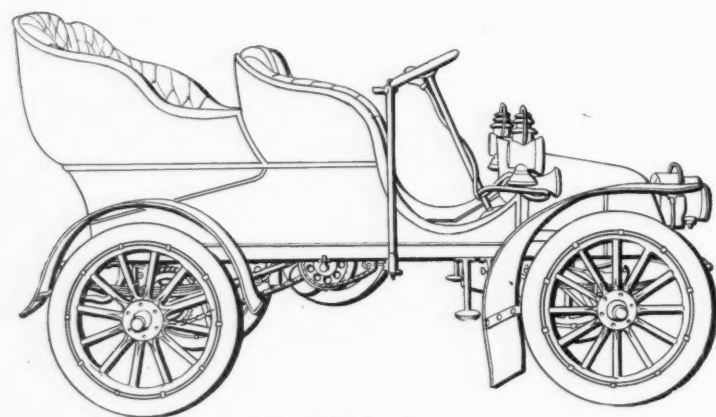
FOUR-CYLINDER POPE-TOLEDO



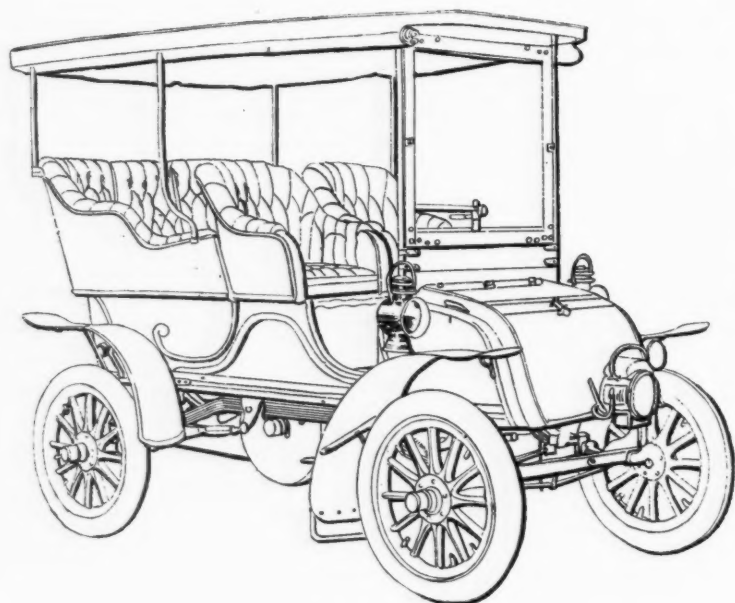
THE MATHESON



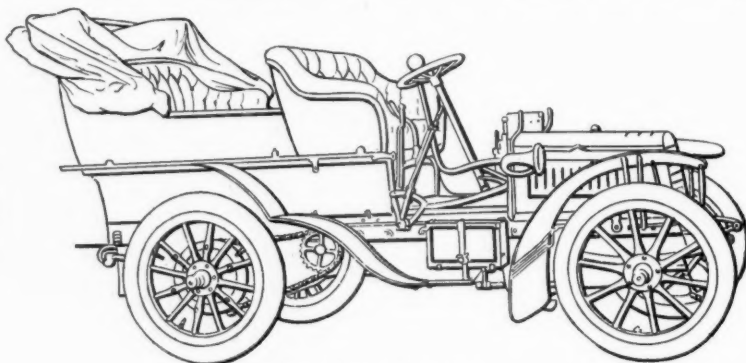
THE PHELPS



THE POPE-HARTFORD



TUDOR KNOX



ONE OF THE PANHARDS

shifted by means of a foot lever, this moving a beveled cam, which alters the throw of the inlet valve and thus controls the speed of the engine, which may also be controlled by means of the spark lead. The spark and mixture control levers are attached to the steering post. A very simple make and break ignition apparatus is used instead of jump spark, this having an arrangement whereby the movement of a lever from the seat makes it possible to cut out one or more cylinders. The drive is by double chain, the differential being on the secondary shaft. The frame is of 3-inch channel iron, and the springs of the semi-elliptical type. Another feature is that a separate exhaust pipe leads from each of the cylinders to a common but much larger pipe, which in turn leads into the muffler, the idea being to do away with the possibility of back pressure and at the same time to partially create a vacuum and tend to draw off the spent gases in the other exhaust pipes. The cooling system is a centrifugal pump and a Whitlock radiator. A large oiler on the dash may be operated by a force hand pump, but feeds by gravity otherwise. A feature is that the two large acetylene lights in front follow the direction of the wheels, thus throwing light always in the direction of the moving car. The rig weighs 2,600 pounds. The car is commodious, seating five people, is nicely finished and upholstered, has a Mercedes bonnet and 34 by 4½-inch tires.

POPE MFG. Co.—The Pope company shows for the first time the Pope-Tribune and Pope-Hartford cars, the former at \$650 and the latter at \$1,050 without tonneau and \$1,200 with tonneau, the former being made at Hagerstown and the latter at Hartford. The Tribune is an air-cooled machine but with a water-cooled head, and will attract attention. It has a single vertical cylinder under the bonnet, the dimensions being 4½ by 4½ inches, which is rated at 6 horsepower. The transmission is through a propeller shaft with universal joint. Wheel steer is used, and the speed change lever is located on the wheel mast to the left of the operator. The sliding gear gives two speeds forward and one reverse, the clutch being of the cone variety. The car has semi-elliptical springs and is painted a dark olive green. The Hartford has a 10-horsepower single cylinder, copper water jacketed motor, 5¼ by 6 inches, the transmission being of the planetary type, with single chain drive. The water tank and a large space for storage are located under the bonnet, while the gasoline tank is under the seat. The speed change and spark levers are handy to the operator's right hand, supported by the seat. The brake, slow speed and reverse are operated by foot levers. The wheels are of wood, 30 by 3½ inches. The car on exhibition is painted red, with trimming of black. As the car is fitted the weight is 1,500 pounds. The frame is of angle iron.

POPE MOTOR CAR Co.—The four-cylinder Pope-Toledo is the feature of the exhibit. The frame is of channel steel with the side bars extending to form the spring hangers. The motor is vertical, with four individually mounted cylinders of 4½-inch bore and 5¼-inch stroke. It is rated at 24-horsepower at 900 revolutions. The cylinders are copper jacketed. The inlet valves are of the atmospherically operated pattern, the company having some time ago experimented with mechanical valves,



and having dropped them as not being as efficient because of the greater compression space, or clearance, required by them. The sliding gear transmission is characterized by the device whereby the secondary shaft is automatically thrown out of engagement when the direct drive is applied, so that there will be absolutely no gears running, even though idle; it is also notable that the gears of the set are of No. 6 pitch and that the whole set is strong and solid. The radiator is of a modified honey-comb pattern and is shaped to correspond to a neatly curved readaptation of the Mercedes bonnet, which is used in connection with the steel hollowed dash with good effect. The other Pope-Toledo shown is the 14 horsepower two-cylinder car. Prominent among the Pope Waverley electric cars is a physician's wagon, which is extraordinarily roomy for a single seat electric of the light class and which, if desired, will be fitted with Edison batteries.

**PANHARD & LEVASSOR**—Three and four-cylinder motors characterize the new Panhards. In these the cylinders are mounted separately upon the crank case. The three-cylinder motor is recommended because of its simplicity and uniform cadence. On the motors above 15 horsepower all inlet valves are automatically operated, and on all machines above 24 horsepower the cylinders may be of either cast iron or steel, the latter being the lighter construction. The ignition is by magneto. The carburation is by the well known Krebs carbureter. The model shown is a handsome tonneau with folding top for the rear seats.

**THE MATHESON MOTOR CAR CO.**—The Matheson is a four-cylinder touring car of 24-horsepower, seating seven passengers and weighing, complete, about 2,800 pounds. It is built with either a rear door tonneau or a side door surrey style rear seat. The body in either case is of aluminum. The frame is of combination wood and steel. The wheel base is 97 inches and the wheels are 36 inches in diameter. All wheels run on Timken roller bearings. The cylinder bore is  $4\frac{1}{4}$ -inches and the stroke 6 inches. All valves are mechanically operated. Either make and break or jump spark ignition is supplied. The carbureter is combined with a fuel pumping system which obviates the float. The transmission is by sliding gears, in which bronze gears mesh with steel gears. The final drive is by double side chains. There are two internal expanding brakes on the rear wheels and a brake on each end of the cross counter shaft. The control of the engine speed is by throttling

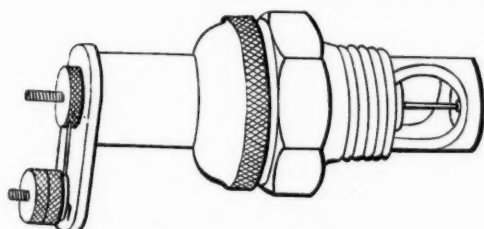
and there is a fly wheel governor which regulates the speed when the clutch is disengaged, to prevent racing. The car is built for rough as well as smooth road work, for beside being strong, has a clearance of 14 inches. It is furnished with a detachable tonneau and with a canopy top upon order.

**PHELPS MOTOR VEHICLE CO.**—The Phelps is a light three-cylinder touring car. It has a wheel base of 84 inches. The 30-inch wood wheels, running on roller bearings, are equipped with 4-inch tires. All the springs are full elliptic. The three-cylinder upright motor is of  $4\frac{1}{2}$ -inch bore and stroke and is said to develop 15 horsepower. The ignition is by primary spark. The sliding gear transmission furnishes three forward speeds and is geared to 40 miles an hour on the direct drive at normal high engine speed. A feature of the final bevel gear drive is the tubular propeller shaft. The body is so made and attached that it may be tilted up as a whole to expose the entire mechanism.

**KNOX AUTOMOBILE CO.**—The full line of waterless Knox cars, prominent among the representatives of air-cooled motors by virtue of their peculiar system of cylinder radiation by pins instead of flanges, was recently described in *MOTOR AGE*. Of those not mentioned at that time, the show exhibit includes the two-cylinder Tudor touring car model with canopy top and glass front. It is only different from the other two-cylinder cars in body construction and equipment, the whole of the Knox line being built upon the basis of two running gears, one with a single and the other with a double-cylinder motor. In the body building of this Tudor model, however, the company has aimed to make it the waterless de luxe.

**ALEXANDER FISCHER**—This importer exhibited the chassis of a Rochet-Schneider in one stand and the Ariès in another. On the Rochet-Schneider the valve mechanism for the intakes is very similar to that of the Corliss type, and the change in the valve movement is made from the dash. The male member of the cone clutch is of the spider variety. The transmission is operated by one lever, and the drive is by double chain. The frame is of the combination type, with semi-elliptic springs. The cam shaft gears are combination fiber and brass, cleanly cut and of generous face. The cooling system consists of a cellular radiator, pump and fan, operated from the gear shaft. The fly-wheel and fan are made in one and the radiator is of the Cronville type.

## THE EXHIBITS OF PARTS AND SUNDRIES



THE SPITFIRE PLUG

**PARISH & BINGHAM CO.**—The general appearance of the metal wheel made by this company is the same as an ordinary wood artillery wheel, except that the spokes are smaller than the ordinary wood spoke. The butt of the spoke is keystone shaped on both sides, and each butt consists of two stampings welded together edgewise. The end of the spoke is threaded and is secured to the rim by a nipple. The standard twelve-spoke rim made by the Standard Welding Co. is used. The hub flanges are steel stampings. The wheels are furnished to order with any type of bearing and with any standard rim section.

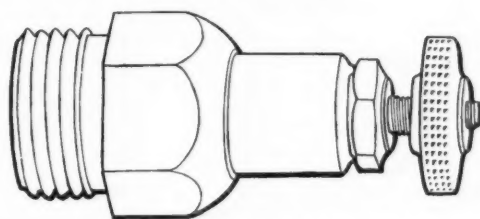
**DAYTON ELECTRICAL MFG. CO.**—Apple dynamos for igniting purposes, primary and jump spark coils, spark plugs, dry cell and storage batteries, and King timers for single and multiple cylinder engines make up the line exhibited. The dynamo has been made smaller than last year's model, the voltage increased and the governors improved in details, which assure more accurate governing of speed. Governors are now supplied for various styles of drive, such as chain, gear, friction and belt. The brush holder has been changed, the double set of brushes being replaced by a single large

combination brush on each side. The ignition outfit is put up in combination, which includes a dynamo with supporting frame, storage batteries, or dry cells, as preferred, and the spark coil, either primary or jump spark as preferred. The combinations are put up to suit all requirements, and with or without governor pulleys. The storage batteries consist of two cells and are used for starting purposes and storage cells for surplus current after the generator is thrown into use. The King timer has been made smaller than the one put out last season, the insulation being heavier around the terminals and the governor with a shorter degree of movement, it now being limited to 22 degrees.

**ARTHUR R. MOSLER**—The principal feature of the Spit-Fire spark plug, and the one which gives it this name, is the protecting chamber surrounding the sparking point. The gases becoming compressed in this chamber explode when the spark is produced and are projected, burning, into the combustion chamber of the engine. Thus it spits fire into the compressed charge in the cylinder and the combustion of the charge is about as instantaneous as is possible.

**VACUUM OIL CO.**—Samples of many grades of lubricating oils and grease are shown by this company, which is making a specialty of lubricants for automobile work, both steam and gasoline.

**HERZ & CO.**—The Omnibus spark plug shown is built on an entirely new principle. The mica insulation is wound and pressed around the central rod, and the whole core ground

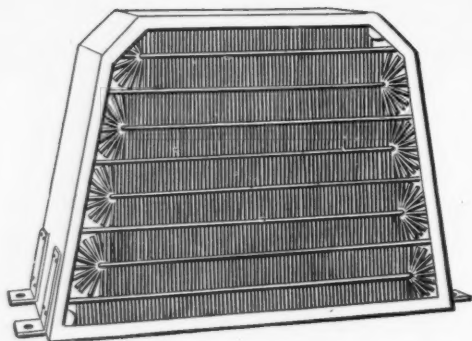


HERZ OMNIBUS PLUG

and tightened to the fitting by means of a cone from the inside of the air space. The insulation is built up out of pure Ural mica, and the claim is made that this air space prevents sooting and carbonizing. The Spark-rite spark plug is hand made, and is fitted by grinding into the cone of the fitting and then secured by a copper asbestos cone from the inside.

**MIDGLEY MFG. CO.**—Midgley tubular wheels are shown in the latest artillery patterns, and one especially is interesting, that fitted with a rim for the new Dunlop tire, to which form of rim the Midgley wheel is most easily adapted. Sections showing the built up formation of the spokes and rims are interesting on account of emphasizing both the clever stamping and the dip brazing employed in making the wheels.

**FAIRBANKS CO.**—The Goodson igniter exhibited is a magneto provided with a spring propelling device connected with a crank on the armature, whereby the armature is made to rotate within the magnetic field for a portion of a revolution at a speed which is entirely independent of the speed of the motor and which is sufficient to generate the current required to



BRISCOE RADIATOR

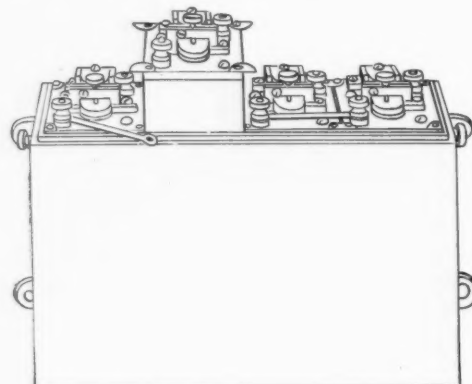
produce a spark. This igniter is so connected by belt or chain with the motor shaft that as the shaft turns it puts the spring impelling device under tension. It is so timed in its tripping action that at a certain point of the piston stroke the spring device is freed, and consequently gives the armature a quick turn, producing ultimately the spark in the cylinder.

BRISCOE MFG. Co.—Both tubular and honeycomb radiators are shown. The tubular radiators are made with any size tubing and with any style or shape of gill or fin. A spirally wrapped continuous fin is a recent addition, and the company will make its own tubing for the coming season. The honeycomb radiators are made of square tubes, set together on the diagonal, with a water space between them; the ends of the tubes being swelled to provide for this water space. The Capucine spiral ribbed radiator will be the leader the coming year. Other articles shown are steel fenders, hoods, tanks and bent tubes.

HYATT ROLLER BEARING Co.—The Hyatt roller bearing formed of rollers of ground steel spirals is shown assembled and as detached parts. Particular stress is laid upon the peculiar adaptability of the Hyatt bearing for the bearings of cross counter shafts in double chain drive cars.

ELECTRIC STORAGE BATTERY Co.—In the four-cell express type the cell has been especially designed to meet the requirements of the business vehicle. The jars are made stronger to resist the hard usage of such service and to reduce the breakage to a minimum. In the sparking cell the design has been materially changed in the terminals. These are rubber covered wires brought up from the element through a lead pipe. The wire terminals are long enough to come through the battery box on the car and are furnished with connectors, so that all connections are made away from the battery.

PITTSFIELD SPARK COIL Co.—Ignition matters claim the attention of this company, from Pittsfield, Mass., the exhibit being composed

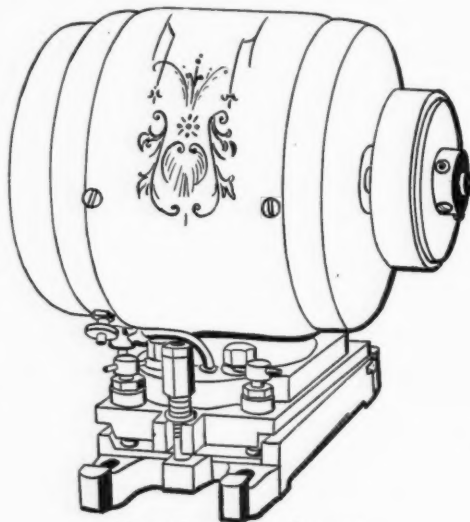


THE PITTSFIELD FOUR-CYLINDER COIL

of spark coils, plugs and dynamos for ignition purposes. The coils are of standard type and are made in sizes from that for motor cycles to the quadruple dash. The feature claimed for these coils is that in the multiple coils each coil is in a separate box. The igniter dynamo is arranged with a friction pulley and either with or without governor to regulate the output. The machine is in an iron case.

HENDEE MFG. Co.—The Indian motor bicycle shown needs little description at this time, being substantially the same as the machine put out during 1903. The principal improvement consists in the grip control, whereby all of the operations in the control of the machine have been made without taking the hands from the handle bar. One peculiar advantage of the mechanism whereby this result is secured is that it may be fitted to any of the Indian motor bicycles now in use.

DOW PORTABLE ELECTRIC Co.—A comprehensive line of coils is exhibited, comprising all styles and all sizes. The high speed double point vibrator used last year has been retained on some models, while in others different types of high speed vibrators are fitted. It is noted that simplicity has been sought in each case



THE PITTSFIELD IGNITER

where changes have been made. One such instance is a quad coil, on which one vibrator is used for all four coils, while another instance is where a non-vibrator coil is made to produce a series of sparks by means of an independent vibrator carried in a separate box and which is intended for dash use, while the quad coil may be carried where most convenient.

N. Y. & N. J. LUBRICANT Co.—The exhibitor shows a line of non-fluid oils and lubricant gums for use in forcing oil into recesses difficult to reach in any other manner. The oil will not drop or run, but is intended to be used in compression cups, the same as hard grease. The gums are made in gun metal, brass and bronze, are compact and may be carried in any tool case.

BULLOCK-BERESFORD MFG. Co.—The Bullock igniter is exhibited at the stand of the Dayton Electrical Mfg. Co. The igniter is made in the form of a plug, which can be inserted in any ordinary spark plug hole, yet gives a series of primary or make and break sparks each time the circuit is closed. No jump spark coil is used. An ordinary primary coil, of high resistance, is advocated in connection with eight cells of dry battery.

ENGLISH & MERSICK Co.—The principal part of this concern's exhibit is an automobile front



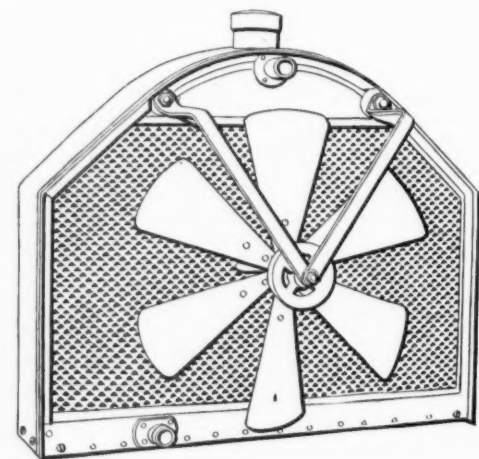
INDIAN GRIP CONTROL

window fixture, with heavy plate glass and polished brass trimmings. There are on this a number of small fastenings so arranged as to prevent rattling. The glass swings clear of the steering wheel and above the operator's head. The exhibit also includes a large variety of door locks, tonneau fastenings, handles, side lamps, horns, hinges, baskets and imitation cane work.

AUTO SUPPLY Co.—Being a manufacturer and jobber the exhibitor shows running gears, engines and differential gears, products of its factory, and jobbing lines covering many important parts and fittings, more especially axium carbureters, Hussey forgings, steering wheels, one piece forged axles and yokes, pumps, etc. In addition, the lines manufactured by Cowles & Co. are exhibited, these consisting of oil and acetylene lamps, brass locks and trimmings for automobiles. An arrangement has been made whereby the exhibitor will sell the product of Cowles & Co.

NEWBURY & DUNHAM—This is a firm doing business on the Harlem river and handling the machinery product of the Western Gas Engine Co., which has a line of two-cycle marine motors, and the White four-cycle motor for marine purposes, the exhibit consisting of a single cylinder 3-horsepower, double cylinder 5 and 7-horsepower and a four-cylinder 20-horsepower, the 5-horsepower motor having a sight gasoline feed.

WHITLOCK COIL PIPE Co.—The exhibit is devoted principally to the Whitlock cellular cooler, although a line of disc radiators and bent tubing is shown. The Whitlock cellular cooler consists of a series of transversely corrugated tubes extending between a top and bottom water tank. The corrugations of every tube are reversed with relation to the two tubes adjacent on either side, thus forming air cells running from front to back. One of the principal improvements is the formation



WHITLOCK RADIATOR



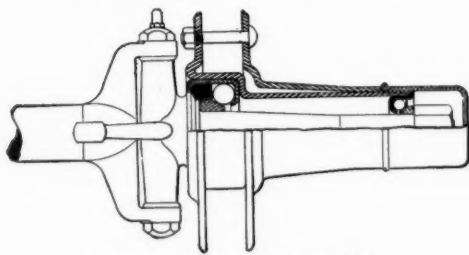
of thousands of little points projecting into the air cells to increase the amount of surface. These points are made by drawing out the metal into minute cups, each of which is full of water, separated from the air only by a thin wall of copper. The cooler is made in two general styles.

C. J. IVEN—This exhibit comprises a very complete line of parts, including Briscoe radiators, tanks, fans, hoods, and a combined tank, radiator and fan in which the latter is almost invisible; the Wheeler Mfg. Co.'s line of brass trimmings and dos-a-dos seats; Loomis mufflers, circulating pumps, lights and transmissions; Russell induction coils, and Standard Carriage Lamp Co.'s lamps, brackets and generators.

GENERAL ELECTRIC Co.—As a manufacturer of electrical equipments, all kinds of switches, circuit breakers, sockets, ammeters and volt meters, dynamos and motors are exhibited. The principal feature of the exhibit is an outfit for charging storage batteries, such as is required in charging stations, garages, etc.

THE JERSEY BRAKE Co.—The exhibit is composed of Searls jacks, Nos. 6, 8 and 9 being shown. The latter is new in design, it having a more substantial base than the Nos. 6 and 8. All parts have been made heavier in the standard sizes.

AMERICAN BALL BEARING Co.—The company shows the adaptation of ball bearings to hubs especially, but does not neglect transmission and other bearings of the power plant of a car. One of the typical wheel hubs shown is drawn



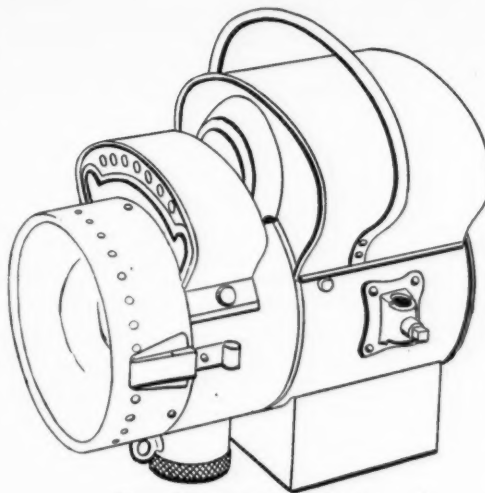
AMERICAN BALL BEARING HUB

from sheet steel, having a smooth finish inside and out. As a front hub the most notable feature of design is the placing of the center line of the spokes as close to the steering head as possible to render steering easy. The ball races are ground after they are in position in the hub shell and the cones in the cone seat on the spindle are ground to gauge.

MORGAN & WRIGHT—The clincher tire being introduced by this company has a special fabric construction which, it is claimed, obviates the rigid, unyielding feature which is the natural result of multiplying fabric layers. By giving an elasticity to the fabric as nearly proportionate to that of the rubber covering as is possible, separation between the fabric and cover is avoided. Bolts are not necessary on these tires on sizes up to 3½ inches.

POPE MFG. Co.—In a separate space, the exhibitor displays three motor cycles, the Columbia, Rambler and Tribune. All the machines are fitted with the Thor motor and parts, although the assembling of the accessories is carried out on different lines on each machine. These differences consist chiefly in the placing of the coils, batteries, carbureters, etc.

AMERICAN COIL Co.—The Acme spark plug made by this company has a sheet of pure mica wrapped around the central electrode in the form of a tube. The electrode with its mica casing is then forced into the central



THE COLUMBIA GAS LAMP

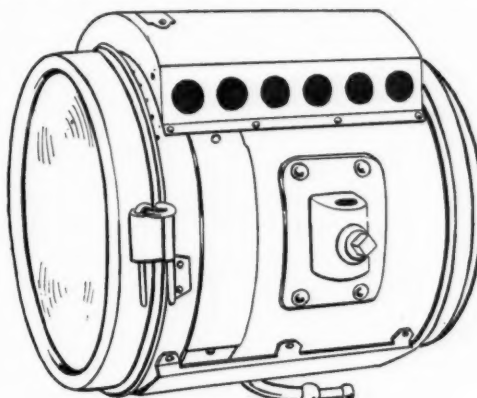
orifice of the porcelain insulation. By this construction the mica wrapping is claimed to act as a perfect insulator, even after the porcelain insulation has become cracked. The American Little Wonder dynamo exhibited has a system of storage in the base which does away with the use of extra batteries for starting. The machine is fitted with four brushes, which insures a good brush contact at all times.

HINE-WATT MFG. Co.—The Columbia automatic gas lamp is peculiar by its gas valve which turns on and off the supply to the burner instantly and which, through this control of back pressure, is self-regulating so far as the flow of water is concerned. The patterns range from small cycle lamps to large typical headlights.

TIMKEN ROLLER BEARING AXLE Co.—The display shows a divided rear live axle and solid rear live axle with compensating gears, steering knuckles, bearings and hubs; bearings and cups for bevel gear drive; axles and wooden artillery wheels with channel rims. The principal theory of the Timken bearings is the employment of tapered rolls operating and running on cones having two ridges which engage the rolls and take up the lateral or end strain. Owing to their taper, the wear at any time can be taken up.

B. F. GOODRICH Co.—The Goodrich detachable tire, which is the company's leader, so far as automobile tires go, is about the same as last year, being a well made form of popular clincher tire. Internal and side wire solid tires are also shown.

ROSE MFG. Co.—A full line of Neverout acetylene motor lamps and oil side and tail lamps is shown. The Neverout headlights for automobiles all contain the Neverout hydro-pneumatic safety system of gas generation, which allows the light to be turned on instantly



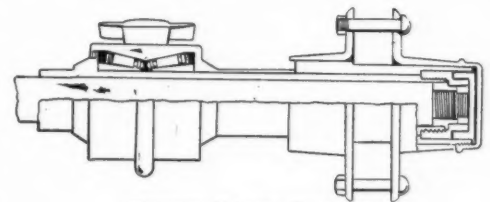
THE NEVEROUT HEADLIGHT

neously and repeatedly and extinguished immediately by the operator. The whole system is controlled by one gas cock, which stops the flow of gas and water simultaneously. The search lights are made in three sizes, of highly polished brass with copper front and back, lens mirror reflector and adjustable focus.

QUIMBY & Co.—The exhibit consists of a 24-horsepower Panhard chassis, fitted with an aluminum body, and tonneau for four people, with canopy top, drop glass front and rounded, portable glass back. The tonneau has individual seats for four passengers and is provided with two extra back rests, which allow the passengers occupying the front seats in the tonneau to face forward. The body is upholstered with black leather, tufted and is finished in pearl gray.

B-OK TIRE Co.—A number of samples of this company's tires are shown, the chief feature of the tire being the sponge rubber center, which is claimed to give the effect of the pneumatic and still avoids the possibility of puncture.

PIONEER AUTOMOBILE & CAMPUS MOTOR Co.—A double cylinder vertical two-cycle motor, without crank case and base compression, and with the shaft and fly wheel on the top of the motor, is displayed by this house. The cylinders are 4 by 4 inch, of common pattern, but minus a base, being hung directly to a special frame. Below the frame are guides for the connecting rod ends, to which are attached rigidly and turned inwardly auxiliary cranks. To these are attached outside connecting rods running upward and above the top of the cylinders on the up stroke. The crank shaft is arranged longitudinally on the top of the

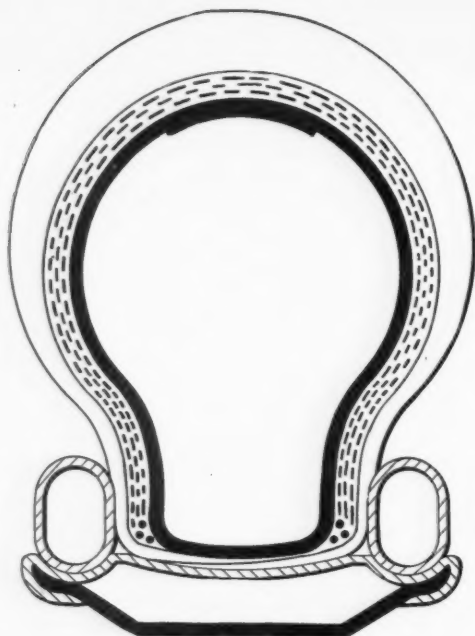


TIMKEN ROLLER BEARING

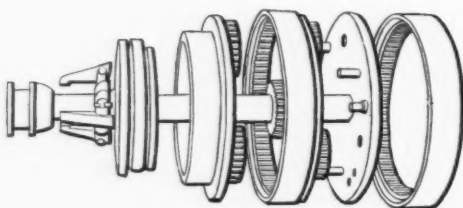
cylinders, with a bearing on each, the cranks, set at 180 degrees, being between the two cylinders. The fly wheel is located between the cranks. Thus all the parts are exposed except the pistons themselves. The carbureter is between the cylinders, the intake pipe branching to each cylinder, as also does the exhaust pipe. Atmospheric pressure is depended upon to charge the cylinders. The intake and exhaust ports are located on one side of the cylinder on the same face, and the commutator is operated direct from the crank shaft extension.

STANDARD WELDING Co.—The exhibit consists of seamless steel rims, clincher and single tube, seamless steel tubing, and all kinds of various forms of electrically welded articles. The seamless steel rims are of the standard pattern, G & J type.

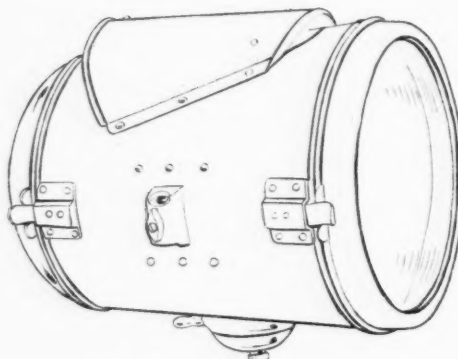
INDUCTION COIL Co.—The exhibit of the Milwaukee house is made in the stand of the Detroit Motor Works. All 1904 coils for dash use are put up in mahogany cases. Instead of the usual corner clips, for mounting on the dash, long metallic strips are used, running across the backs and projecting beyond the sides of the cases sufficiently to allow the use of bolts for fastening. The lids are hinged on the front of the boxes, which allows the same to be opened toward the rear of the car, although attached to the dash. New vibrators of three



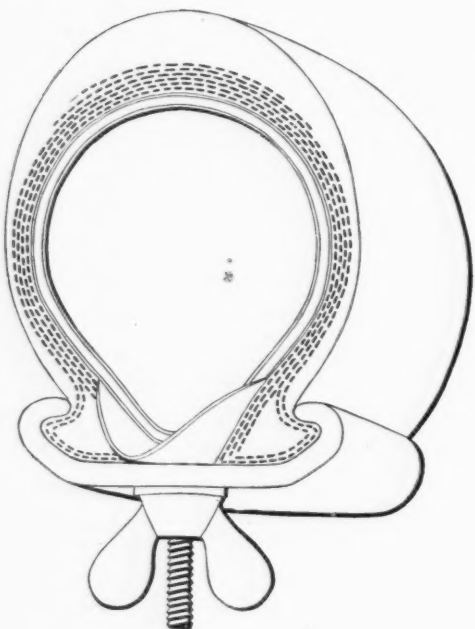
NEW DUNLOP TIRE



CHAMPION PLANETARY GEAR



RICHMOND RACING LAMP



GOODYEAR CLINCHER TIRE

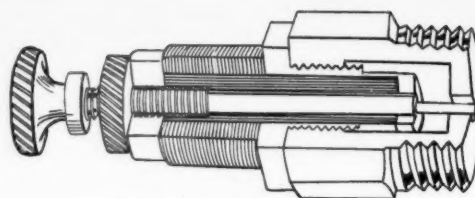
types are shown. One consists of a double spring, rigidly attached by means of which high speed vibrations are secured; another is made with the regular single spring, with half spring mounted over it. This is called the medium speed vibrator. The third type has a double bridge, with two means of adjustment, and affords various speeds, according to regulation.

HARTFORD RUBBER WORKS Co.—Single tube detachable and clincher automobile tires, solid rubber tires and a line of automobile mats are shown. In the improved Dunlop tire the rim consists of a hollow ring flattened at the point of contact with the wood felloe of the wheel, slightly concaved at the tire seat to form a cup in which the inner tube will round out naturally under pressure. It is also concaved at each edge for the receipt of tubular elliptical side flanges which are rendered removable by means of a turnbuckle provided with right and left threads. The Hartford clincher tire shown is built under the G & J patent, but follows the foreign style and construction closely.

RICHMOND MFG. Co.—Something of a novelty in the line of gas generators for acetylene lamps is put out by this house. The generator is so made that it is not necessary to remove the carbide from the original package to fill the lamp, a 2-pound can being put into the generator and a screw turned, which in turn breaks the can, much the way as is done in a fire extinguisher. In addition but one screw is used to regulate the water and gas supply, and this screwed down extinguishes the light immediately. Inside the brass outer wall is a lining of asbestos and this is held in place on the inside by heavy tin lining.

GOODYEAR TIRE & RUBBER Co.—Patches form one part of this interesting exhibit. These patches are of various sizes for repairing inner tubes of clincher and detachable tires. Each patch has the name of the company and the number of the patch. Eleven sizes are made. A novelty is a water proof inner tube bag, which protects the inner tube from wear and tear, grease and water. A sample board shows the different styles and sizes of tires manufactured. The latest product is the Michelin construction of clincher tire. This tire is round in section instead of being elliptical.

CHAMPION MFG. Co.—Different size planetary speed change gears are shown, for light runabouts, medium weight wagons and heavy wagons and trucks. All the gears are spur gears cut from the solid piece, and all parts are in-



THE NEVERSKIP SPARK PLUG

terchangeable. The wearing parts are bronze bushed.

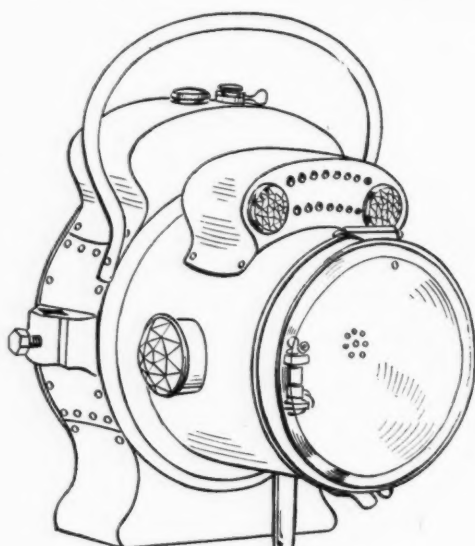
POST & LESTER Co.—The Neverskip spark plug is the new candidate for public favor offered by this company. The spark in this plug jumps from the point of the wire to the nearest edge of the metal surrounding it. The hole in the protecting cap, through which the wire is brought up flush, is considerably larger than the wire, thus leaving the space necessary for the spark to jump; yet it is small enough to prevent the flames of combustion in the cylinder from passing back into the chamber and depositing carbon on the insulating parts. The plug is supplied in various threads.

20TH CENTURY MFG. Co.—The large burning acetylene gas headlight is the leading attraction at this exhibit. The internal construction is very simple and easily understood. Large oil lamps for headlights and side lights are also shown. The Grand and Mammoth oil kerosene lamps are specialties. The company also has a line of horns and one or two brass sundries.

AMERICAN MOTOR Co.—The Marsh motor cycle is exhibited by this company, which recently purchased the stock of the Motor Cycle Mfg. Co., which failed some time ago. The new machine has been improved by the addition of an automatic oiling device for the engine, head fittings being made heavier, quadruple forks of heavier construction than formerly, new method of balancing the engine, which has recently been patented, 2-inch single tube or detachable tires, as preferred, and a regulator for air at the inlet into the carbureter. An extra spring seat attachment is also exhibited, being so constructed as to be mounted over the rear wheel.

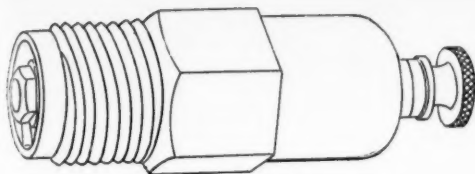
SALISBURY WHEEL & MFG. Co.—The Salisbury is a wood wheel peculiar in the hub end fastening of the spokes. Each hub flange has radial ribs of V section and each corner of each spoke is slightly chamfered to correspond. Thus when the wheel is assembled the ribs project slightly between the spokes without separating them. The flanges are dished so that when drawn together the spokes are locked in place by pressure on all four sides and of such directions of application that withdrawing tendency is directly combatted.

DETROIT MOTOR WORKS—An exhibit of the Sta-Rite spark plug, auto-jack, auto-click and auto-stick. Spark plugs are shown in twelve styles for different types of cars and engines; these include three 1/2-inch of different shapes of plugs, one style each, for Winton, Peerless, Autocar, Locomobile, Knox, Thomas and other cars. The metric thread is furnished as a standard, in two styles, as are 3/4-inch plugs, with extra long shells for use especially in heavily jacketed cylinders or heads. The plugs are improved, particularly at the top end of the inside porcelain, a steel spring tension washer being used at that point the same as on top of the porcelain cap, to take care of the expansion between the porcelain and the inside electrode. The Sta-Rite auto-jack is made of



THE 20TH CENTURY HEADLIGHT





THE STA-RITE SPARK PLUG

malleable iron, has spiral gear and ratchet combination. The auto click is a small pocket device, by means of which the condition of a set of batteries may be determined. The instrument makes a clicking sound if the batteries provide a current of more than three amperes. The auto-stick is a device made in three sections, folded up when not needed and carried in a leather case, by means of which the quantity of gasoline in any standard car can be determined.

COLUMBIA LUBRICANTS CO. OF NEW YORK—Monogram oils and greases comprise this display. For the convenience of automobile users the goods are put up in small packages and consists of light and heavy gas engine oil, automobile machine oil, motor and graphite gear grease.

BARTON BOILER CO.—Several improvements have been made in the Barton burner, chief of which is the addition of a safety valve thermostat. Besides this, a new kerosene burner is being introduced. In the 1904 boiler the tubes have been increased in diameter from  $\frac{1}{4}$  inch to  $\frac{3}{8}$  inch, thereby giving a greater heating surface and permitting of a larger capacity. A bevel gear which is attached to the valve on the main burner does away with any possibility of the valve opening through vibration and thus altering the heat under the boiler. A new condenser is also among the things exhibited.

ROCHESTER STEAM MOTOR WORKS—Little change has been deemed necessary in this product by the maker, but the ports have now been so made that they are all in line, giving better valve action and a positive and quick cut-off.

CASE MFG. CO.—At the last moment this concern secured space and has on exhibition a new steering wheel, axles and differentials. The axles are made heavy and the keyway is dispensed with through means of a square end engaging a square hole. The two halves of the axle are interchangeable, so that a mistake in ordering a part will have no effect should the order be ambiguous. The axle is made for bevel gear drive.

A. H. FUNKE—A device for storing acetylene gas is shown, which obviates the use of a generator with automobile lamps. The salient features are, the use of porous brick or asbestos with which the tanks are filled, and the use of acetone in combination with acetylene, the effect of which is to greatly increase the capacity of the tank under a given pressure. In the future, all the Funke separate generator lamps will be designed for use either with this tank or the separate generator, so that no different requisitions for lamps will be necessary when this equipment is used.

CONTINENTAL CAOUTCHOUC CO.—The principal novelty of the Continental display is a flat thread tire for rear wheels to prevent skidding. A complete line of Continental tires from  $2\frac{1}{2}$  to 5 inches is shown; also tire sundries, consisting of pouches, repair outfits, bandages, plasters and other small articles.

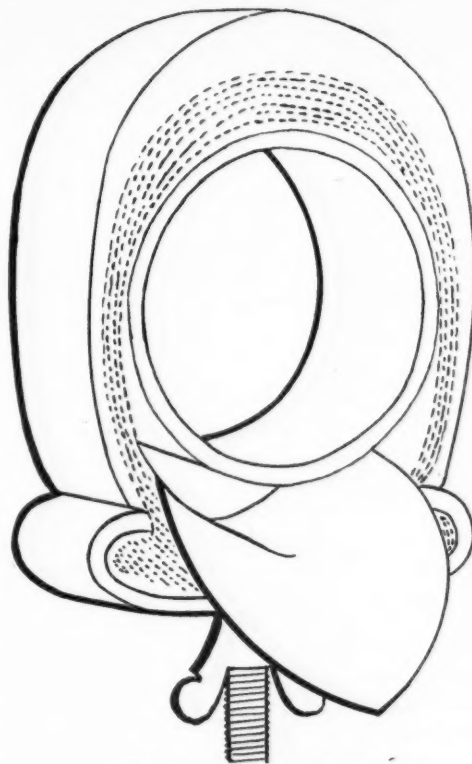
THE GRAHAM CO.—Anticipating the overloading of cars on rough roads, the Graham Co. is marketing a series-multiple buffer which may

be attached to any ordinary car in place of ordinary springs. Inside of a large spiral spring is a case which contains a smaller spring, and inside this is a still smaller case which contains another spring. The smallest spring is designed to take the load of the empty car or with one passenger; the middle spring will carry a full load, including fuel and water, while the outside or largest spring acts only when the car is receiving an excessive jolt when striking a deep, sharp hole or an obstruction. In addition the company shows a supplementary spiral spring which may be attached to any spring car as a safeguard against broken springs.

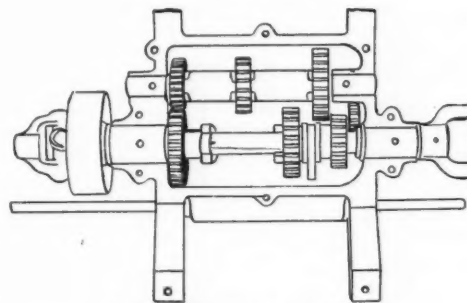
CHARLES E. MILLER—Being a jobber of motor car parts, appurtenances and sundries, the exhibitor shows selections from a great line of such products. Many of these are of standard character, some of the firms represented being also individually represented. One of the interesting features of the display is the three-speed and reverse sliding gear transmission made by the Locke Regulator Co., which until recently was chiefly interested in the production of parts for steam cars, but which has now taken up the manufacture of gasoline car factors. The gear is of the usual pattern with the sliding gears on the main shaft, which may be coupled with the clutch section of the motor shaft to furnish direct drive on the high speed.

O. K. MACHINE WORKS—A sliding gear transmission is shown, having three speeds forward and a reverse. The speed ratio is three to one on the high speed, six to one on the intermediate, twelve to one on the low, and eighteen to one on the reverse. The motor is coupled to a shaft which projects out of the front end of the transmission case. The company also makes a smaller and lighter gear for use with motors up to 10 horsepower and a larger gear suitable for cars having motors of from 20 to 40 horsepower. The 20-horsepower size weighs 108 pounds and has an aluminum case.

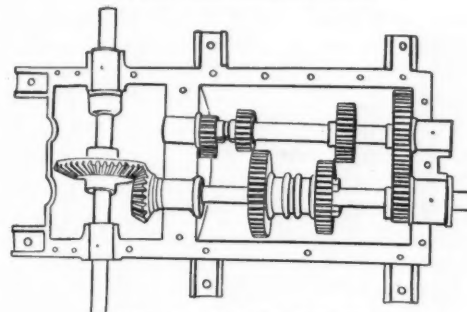
MICHELIN TIRE CO.—This well known French tire concern occupies a large space in the basement, where all sizes of tires are shown, as well as a couple of motor cycles with Clement motors, which are placed in the fore part of the frame at an angle. The machines are belt driven and have double front forks. The motor is rated at  $1\frac{1}{2}$  horsepower, has the controlling levers near at hand on the top bar



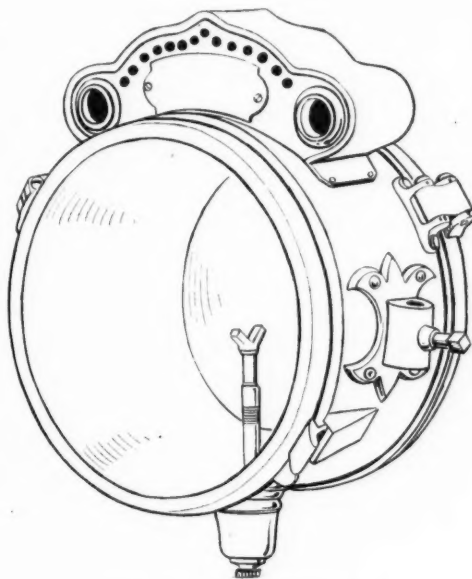
THE CONTINENTAL TIRE



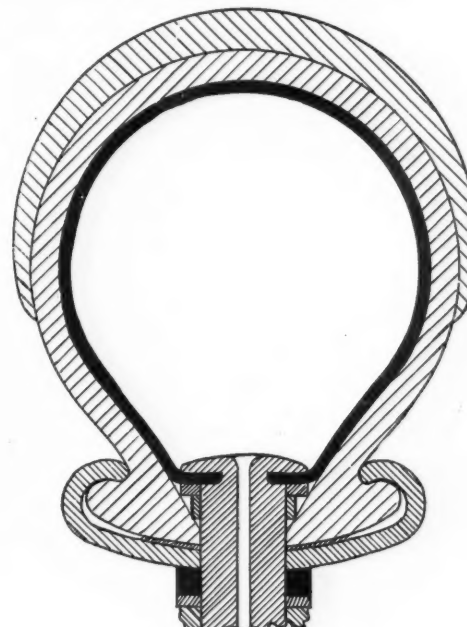
LOCKE TRANSMISSION GEAR



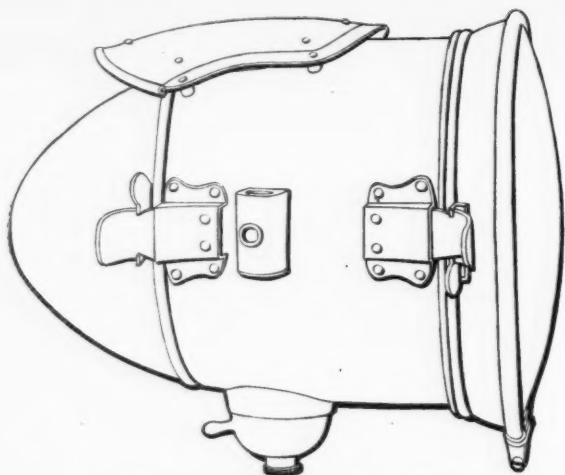
THE O. K. TRANSMISSION



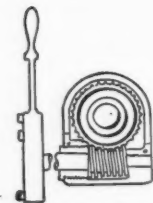
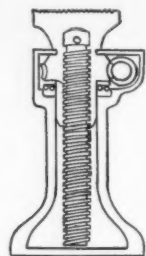
ONE OF FUNKE'S AUTOLYTES



THE MICHELIN TIRE.



GRAY &amp; DAVIS BULLET LENS REFLECTOR



UNIVERSAL JACK



G &amp; J CLINCHER TIRE

while the gasoline tank is back of the seat. So far as the Michelin tires are concerned, there has been no change made over the tire of last year that is worth mentioning.

**GRAY & DAVIS**—A variety of styles of acetylene and oil lamps are shown. The gas headlight with lens mirror searchlight reflector is the leader. Oil side and tail lamps, generators and parts are also exhibited.

**LIGHT MFG. & FOUNDRY Co.**—The automobile brand of aluminum castings made by this company are of a special alloy for which is claimed a tensile strength of 33,000 pounds, making it very tough and capable of holding threads as well as the heavier metals. Many parts of engines and transmissions are now made of this alloy.

**UNIVERSAL JACK & POWER Co.**—One advantage claimed for this jack is that only one man is required to operate any size. It will elevate a load to a small part of an inch, and when elevated the load can be supported for any length of time. The jack is ball bearing. Another feature is a device for moving the jack with its load, when elevated any distance, by the same power with which it is elevated.

**E. J. WILLIS Co.**—The Yankee searchlight, made by this company, is a principal feature of the exhibit. The lamp is designed to fasten on the dashboard by a swivel bracket hinged on the side of the lamp; the bracket is also pivoted at the bottom so the lamp can be turned at any angle. Yankee mica spark plugs, wire terminals, lamps and horns, of which the parts are imported in the rough and assembled at the factory in New York, are also shown. The company is making a number of new specialties

for manufacturers, jobbers and dealers at the factory.

**G & J TIRE Co.**—The distinguishing feature of the G & J tire aside from its well known clincher construction, has always been the corrugated tread. The object of this is to overcome skidding on slippery roadways. The tires are also supplied with smooth tread if desired. Tires for automobiles, motor cycles, bicycles and carriages are shown.

**EMIL GROSSMAN**—This exhibit of automobile accessories shows a line of lamps, horns, spark plugs, jacks, etc. The lamps shown are the Ducellier headlights, generators and oil lamps; Continental headlights and generators, Alpha rear lamps and all kinds of lamp parts and sundries. Over forty styles of horns are shown.

**WHELOCK MOTOR CAR CLOCK Co.**—A small clock, encased in brass, and arranged to attach to the dash is shown. The front part of the brass case is detachable so that the clock may be removed to be wound.

**VEEDER MFG. Co.**—The Veeder odometer, while built for high-speed touring cars, may be applied to lighter vehicles. Special attaching fixtures to suit any peculiar axle construction are furnished at cost. Cyclometers, counting devices and tachometers are also shown.

**FIRESTONE TIRE & RUBBER Co.**—This display shows the Firestone side-wire solid tires. In the way of novelties there are on exhibition wheels with tires that have run 14,000 miles without repair. In the construction of the Firestone tire the rubber is molded in circular molds, in either endless or butt end form. Steel cross bars are inserted laterally near the inner edge

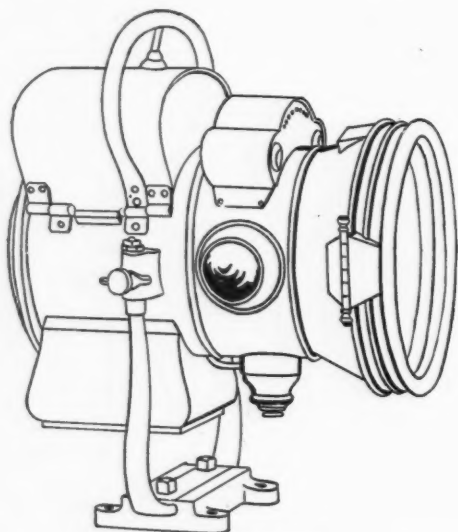
at regular intervals, and the tire is then vulcanized to the proper density to easily carry the weight for which it is intended.

**RUSHMORE DYNAMO WORKS**—The Rushmore people exhibit an immense searchlight designed for use on a ship and one of similar pattern but designed for use on a small car. The feature of the company's goods shown is that the carbide is contained in a wire basket, which enables all of the carbide to be consumed, the ash after consumption dropping down through the screen into the bottom of the generator.

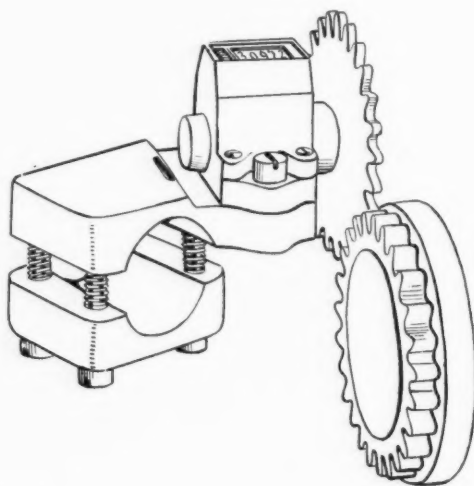
**FAWKES RUBBER Co.**—The Fawkes tire is called indestructible and airless, and in addition to a line of new samples there are shown several tires that have seen service. The tire is made with sections, has a heavy fabric and on the side next the rim is an aperture the entire length of the tire, which is depended upon to give resiliency.

**SAKS & Co.**—In one of the big Decauville cars in the restaurant section this automobile clothing house has four inanimate figures dressed to show the latest thing in automobile clothing.

**MODERN MFG. Co.**—Exhibit consists of a pair of mounted wheels, which are used for operating the dashboard odometer made by the company. The instrument registers mileage of each trip as well as keeping total record of season's mileage. The trip dial registers to 1,000 miles. The total record registers to 100,000 miles. Either dial may be set back to zero at will. They are made for 28, 30, 32, 34 and 36 inch wheels. A dash clock and holder are also exhibited, the clock being furnished with one extra hand which may be set at what ever time a



YANKEE HEADLIGHT

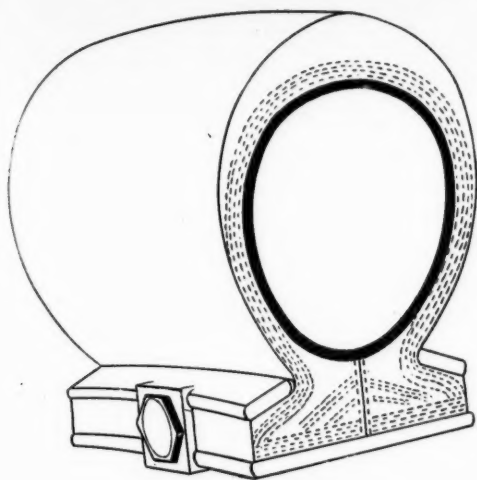


VEEDER ODOMETER



THE FAWKES TIRE





THE FISK TIRE

trip is begun, thus always showing the time the start was made.

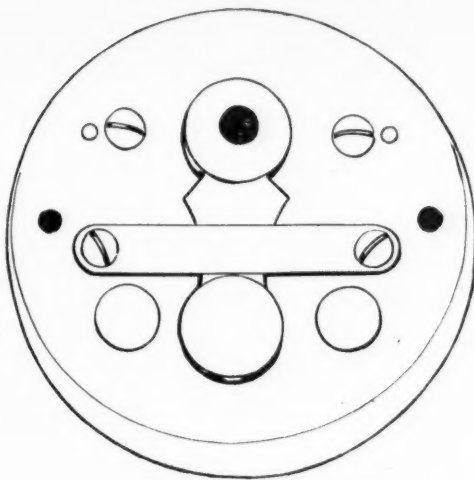
**FISK RUBBER CO.**—The Fisk detachable tire, new a year ago, well known now, is displayed in the usual sizes. The Fisk tire is mechanically fastened on a flat rim by means of annular flanged rings held to the rim sides and drawn toward each other by cross bolts, thus clamping the flanged base of the tire casing positively in position. The inflation of the tire has nothing to do with its attachment to the rim.

**CRAMP & SON SHIP & ENGINE BUILDING CO.**—The exhibit comprises samples of manganese bronze castings for such purposes as gears, motor crank cases and transmission gear cases and sprockets. The company is old in this line of manufacture.

**STODDARD TIRE CO.**—Four tires are exhibited, two being of the detachable type and two of the single tube variety. These tires are claimed to be strictly puncture proof owing to the vulcanizing of the fabric, that process making the fabric and the material with which it is coated sufficiently tough to resist the passage through it of nails, etc.

**WHALEBONE RUBBER CO.**—The trade mark of this company—whalebone rubber—is held to indicate that the rubber in the tires is as tough as whalebone. The fabric and rubber are said to be inseparable. The tires are guaranteed puncture-proof under reasonable conditions, provided they are not subjected to excessive abuse or neglect. Whalebone automobile tires are equipped with chafing strips, consisting of a heavy layer of fabric applied to the rim side of the tire where it comes in contact with the edges of the rims.

**C. F. SPLITDORF**—A line of standard box and

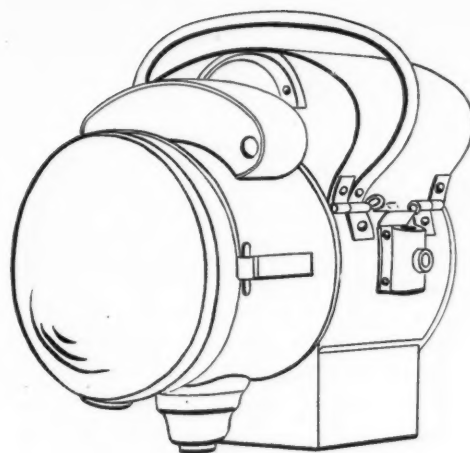


SPLITDORF TWO-WAY SWITCH

dash coils for single and multiple types for one or more cylinder engines, comprises this exhibit. The latter models are fitted with new hammer type vibrators, which break the circuit with rapidity. The vibrators are of the high speed type and sensitive. The ends of the vibrators, which are located over the core ends, are copper plated. Double adjustments are used, a separate lock being provided for each. A new departure is shown in a double pole switch and cut-out plug being fastened to the front of the coil box and made a part thereof. As all connections are made inside the box, the construction simplifies the wiring of a car, allows of the space ordinarily used for the switch being used for other purposes. Spark plugs of the same general style as made heretofore are exhibited, as are coils without vibrators. The attraction at the stand is a large coil, the spark generated being 22 inches between terminals.

**WHEELER MFG. CO.**—Side hampers, rear deck hampers, umbrella baskets, a line of brass trimmings and dos-a-dos seats from the automobile sundry department of this company make up this display. It was the intention of the company to exhibit automobiles, but they could not be gotten ready in time.

**IMPERIAL WHEEL CO.**—The Imperial artillery wheel for automobiles is a combination of the Sarven principle of wood hub, miter and tenon of spokes, with suitable flanges for strength and to receive the bearings without in any way weakening the wood hub, but supporting and strengthening it. The spokes are glued on tenons and miters and driven into the hub. The flanges are recessed on their inner centers to receive the ends of the hubs, the outer centers being fitted to receive the bearings.

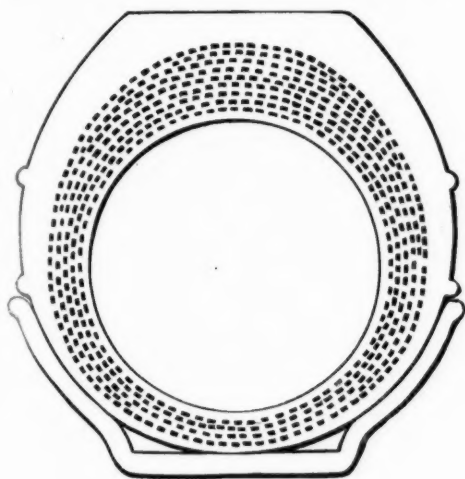


SOLAR HEADLIGHT

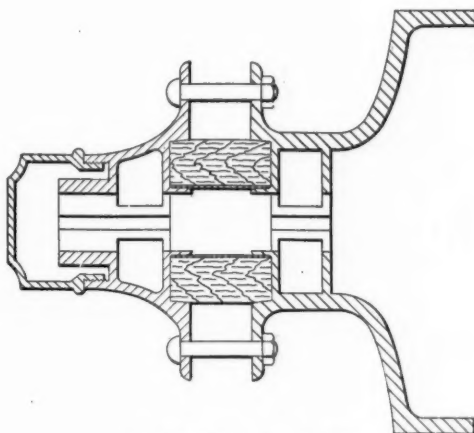
**BADGER BRASS MFG. CO.**—The Solar lamp line shows a number of improvements. In the new lamps offered the Junior oil side lamp for automobiles is made entirely of brass, copper riveted throughout. It has a 1-inch red rear signal and an aluminum reflector. The Standard motor acetylene lamp has a new carbide fount fitted with a false bottom and rolled thread. The company is also showing generator lamps similar in construction to the flame hood of the Phare Solars. The Phare de Luxe is a self-contained generator lamp similar to the Phare Solar, except that it is fitted with lens mirror reflector. The flame chamber has aluminum lining, as well as the door and body.

**COLE & WOOP**—Show one aluminum tonneau body, partially finished. The remaining work will be done during the show in order to demonstrate to the public, the class of work done by the concern. The metal is hammered by hand to the desired shape, then braced.

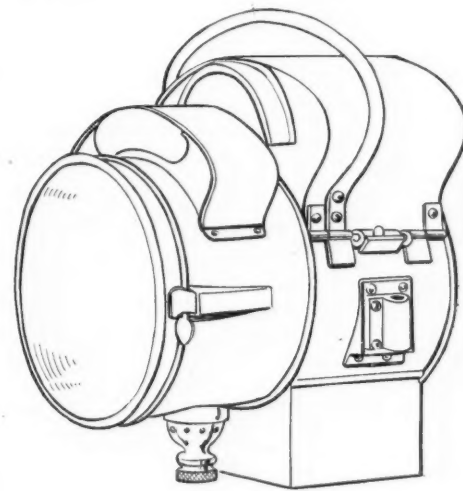
**ATWOOD MFG. CO.**—A complete line of Stay-lit oil and acetylene lamps, of various sizes, the latter type being entirely new this season, is shown. Changes in the oil lamps consist chiefly in the fluted reflectors in the No. 1 model, and heavy plate glass covering for all reflectors. The No. 3 has lens with colored section across the top, red in one and green in the opposite side lamp. The tail lamp is a new production; is fitted with red lens in front, and has white lens of smaller size for throwing the light on steps or numbers carried on the rear of vehicles. A smaller size of tail lamp is also shown, made much on the same principle as the large one. Acetylene headlights are shown in four styles, the No. 6 and No. 5 being of the self-contained patterns, while the No. 4 and No. 7 are made with in-



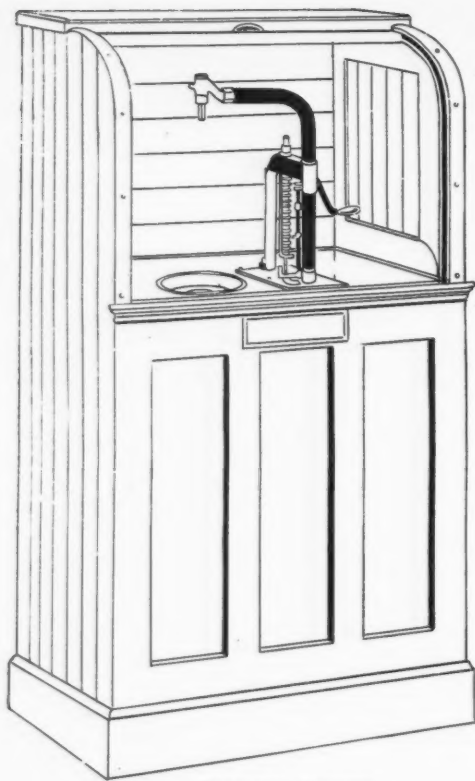
WHALEBONE TIRE



AN IMPERIAL REAR HUB



ATWOOD HEADLIGHT



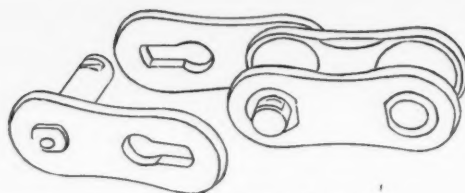
BOWSER GASOLINE CABINET

dependent generators. A new headlight, of the independent generator type, is shown, the shape following the lines of a cartridge or bullet. A full line of brackets, for all styles of lamps, made by the company, is shown.

S. F. BOWSER & Co.—This firm shows two cabinet lubricating oil tanks, one with open top and the other with roll top, which may be locked. The tanks are designed for garage, factory and individual use and are made in sizes to suit requirements. They are so adjustable they may be set to draw at one operation of the handle any desired quantity of oil, the holding capacity ranging from 1 to 5 barrels. In addition the Bowser gasoline tank and pump, the former to be under ground, are exhibited. This type of tank is also made in a variety of sizes and styles.

POPE MFG. Co.—The exhibit comprises a complete line of accessories, such as French horns, with and without flexible tubing, electric pocket lamps, pumps, and oil syringes. Horns of extremely large sizes are shown.

T. J. WETZEL—The Baldwin chain, which is exhibited here, is somewhat simplified for this

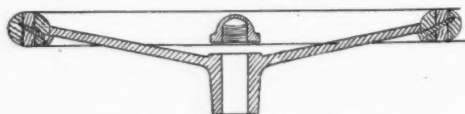


THE BALDWIN CHAIN

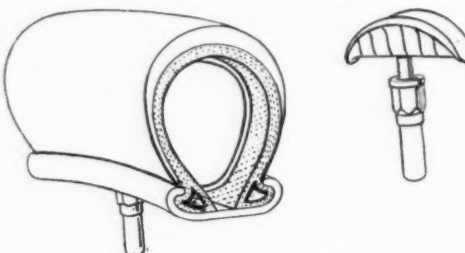
season, being now made in two rather than four parts. Instead of the pin being removed from the links at one end, the chain is so made that the two pins are respectively riveted to the two links. In joining, the ends of the pins are passed through the large holes in the center of the links and are then drawn into the slot cut from the center hole in either direction toward the end. This brings the free ends of the pins obliquely opposite. In addition Mr. Wetzel shows the brass spider and laminated wood handle steering wheels made by the Centaur Motor Co., steel frames and steel wheels made by Parish & Bingham, and a new tilting steering wheel.

CORLISS & Co.—Exhibit two wheels fitted with heavy, wide tires. They are intended especially for heavy traffic vehicles. The construction is such as to make a substantial and durable tire.

DIAMOND RUBBER Co.—A departure in construction most noticeable in the Diamond detachable or clincher tire is the use of a rubber-covered lug in place of the customary



THE CENTAUR STEERING WHEEL

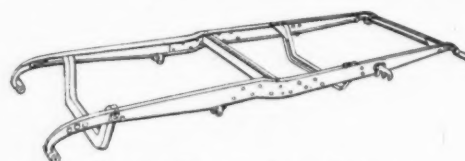


DIAMOND CLINCHER TIRE

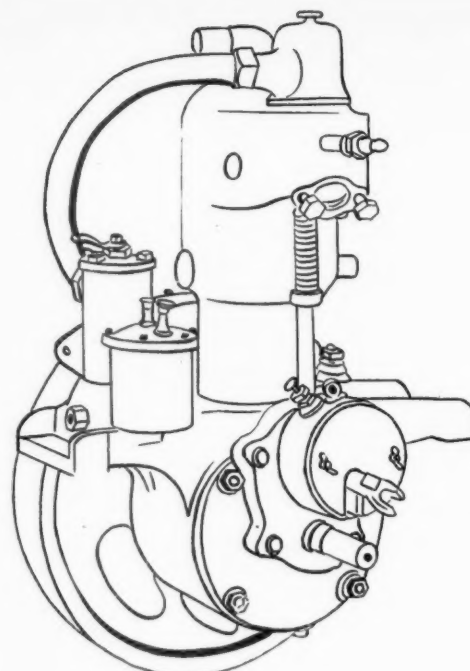
leather-covered article. For this the claim is made that chafing is prevented and tire is made waterproof. The lug is fastened by a wrench. The use of a loose washer on the lug is done away with by the presence of a swivel washer attached to the nut. A pair of tires from Old Pacific is exhibited. The single tube automobile tires show a general addition of strength at every point.

BROWN-LIPE GEAR Co.—Aside from the nine models of equalizing gears for chain or bevel drive, known well on account of being first of the spur gear pattern, two sizes of the company's back lock steering gear are shown. This device operates by a double worm and a gear and is provided with take-up for wear.

FEDERAL MFG. Co.—Here is a large number and variety of special parts, such as rear axles, front axles and frames, made to customers' specifications, the object being to show that the automobile industry wishes to avoid an excessive plant investment. The standard



FEDERAL PRESSED STEEL FRAME

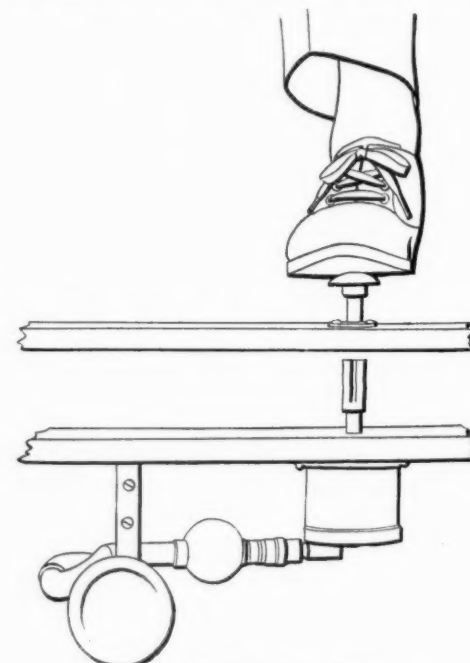


THE HOLLEY MOTOR

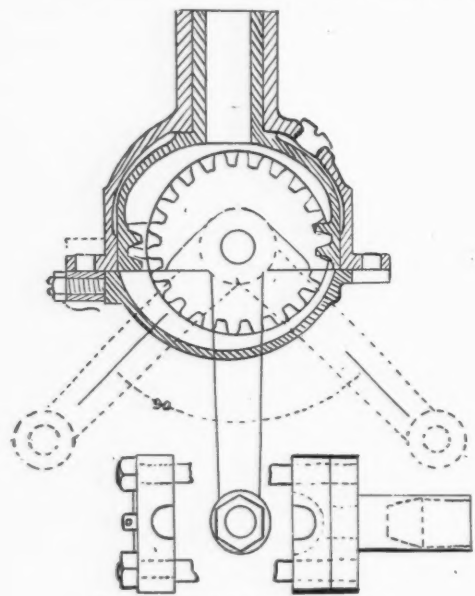
line of parts does not seem to be complete except for electric vehicles. The variety and workmanship of the pressed steel frame parts appear to substantiate the claims of the company for the thoroughness of its preliminary experiments in this branch of activity. A display of light and heavy standard parts, the Diamond automobile chains and high duty steel balls complete the exhibit. There was also shown a complete line of new parts for heavy trucks, such as hangers for motors, distance rods, brakes of several patterns, and such articles as are not made especially by wagon makers proper.

CENTAUR MOTOR Co.—In the automobile steering wheels of this company the rim is built up from three plies of selected rock maple, each having a varying direction of grain in order to insure a rigid construction and a true circle. The arms of the web are engaged by the use of heavy-gauge brass screws. The cap nut is of polished brass and serves as a lock nut.

GLEASON-PETERS AIR PUMP Co.—There is apparently an endless number of styles and sizes of pumps in this display. One novelty is a



GLEASON-PETERS FOOT HORN



THE BROWN-LIPE STEERING GEAR

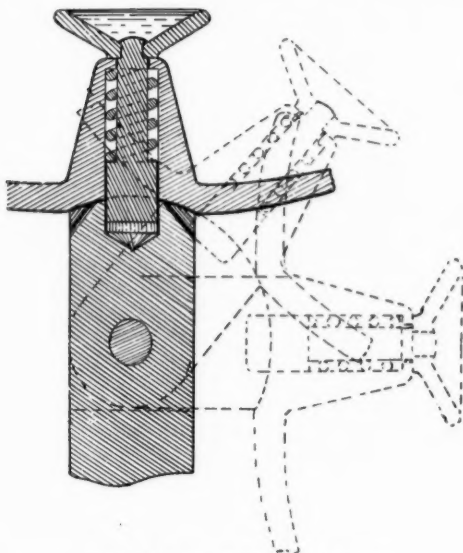


foot horn which may be fastened underneath the body of the vehicle. This horn overcomes the necessity of taking the hand off the steering gear to blow the horn. The pump is attached by rubber tubing. The whole apparatus weighs only 2 pounds. Another device is an oiler made of heavy brass tubing with cork washer on the end of the plunger rod. The spout is seamless.

**WHITNEY MFG. Co.**—This company shows a line of automobile, bicycle and motor cycle chains for main drive, circulating pumps, cooling fans, starting devices, etc., and also samples of keys and key seat cutters illustrating the Woodruff patent system of keying.

**VARLEY DUPLEX MAGNET Co.**—This exhibitor shows, for the first time, a line of Jumpflame coils. The cases are shown finished in oak and white; the vibrators are assorted in variety and construction. Coils for all classes of work are made. The secondary coils are carried in porcelain casings, while glass tubes are used between the primary and secondary windings to insure good insulation. Some coils are fitted with two condensers.

**WARNER DIFFERENTIAL GEAR Co.**—The feature of the steering wheel made by this company is that it tilts two ways, which makes it twice as convenient as a single tilting wheel. It is said that when tilted it will not rattle



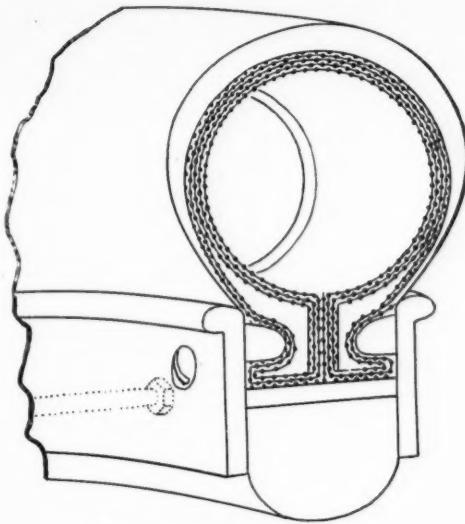
THE WARNER STEERING WHEEL

and cannot be broken off; when placed in steering position it locks automatically and is perfectly rigid; and when tilted the rim of wood wheel cannot hit the post, thus preserving the finish of the rim. The wheels are made in all sizes.

**LEON RUBAY**—A number of French novelties handled by this importer are shown, including Lacosta mechanical oilers, horns, clocks, oil syringes, coils, throttle and spark lever control levers, and particularly a new device to cut out one or more cylinders to determining which one, if any, is missing.

**SPRINGFIELD METAL BODY Co.**—Aluminum and sheet steel bodies in king of the Belgians and other popular styles are the line of this exhibitor. They are made in sizes for all cars and a specialty is made of bodies with oval top square hoods or other hoods of similar shape. These bonnets may be either of aluminum or steel. Cellular coolers and canopy tops are also produced.

**INDIA RUBBER Co.**—Taking advantage of the troubles which fall to the lot of the automo-



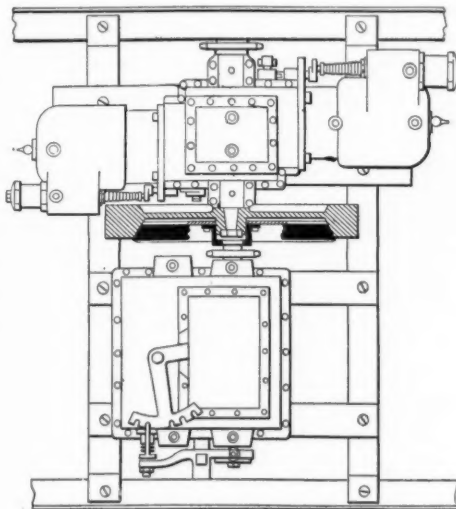
THE INDIA DETACHABLE TIRE

bilist who uses pneumatic tires, the India Rubber Co. shows a number of samples of solid tires, together with its full line of pneumatics. In addition to a tire of the G & J type the company has a tire of its own, which has some features of a nature different from the G & J type. The India single tube motor tire and a single tube pneumatic tire for carriages are also shown.

**J. B. COLT Co.**—The feature of the acetylene lamps shown is the generator, which comprises the usual chamber and a removable cover provided with a simple fastening arrangement whereby an hermetically sealed cartridge of calcium carbide may be inserted. When this cartridge is used up the cover is removed and the cartridge taken out bodily and thrown away. The device, of course, obviates the trouble of cleaning the generator chamber of free slacked carbide, which often hardens and cakes.

**R. E. DIETZ Co.**—This company has been making oil lamps for 63 years and only about a year ago put a gas lamp on the market. In the gas lamp the water is fed to the carbide through a capillary film and the amount of water furnished is controlled by the pressure of the gas. Three styles of gas and three of oil lamps are exhibited.

**BRENNAN MOTOR MFG. Co.**—Motors from 6 to 20 horsepower and a full line of sliding gear transmissions, giving three forward speeds and a reverse, for chain drive, bevel gear drive to counter shaft or direct to rear axle, constitute this display. The crank case of the motor is of a new design with substantial

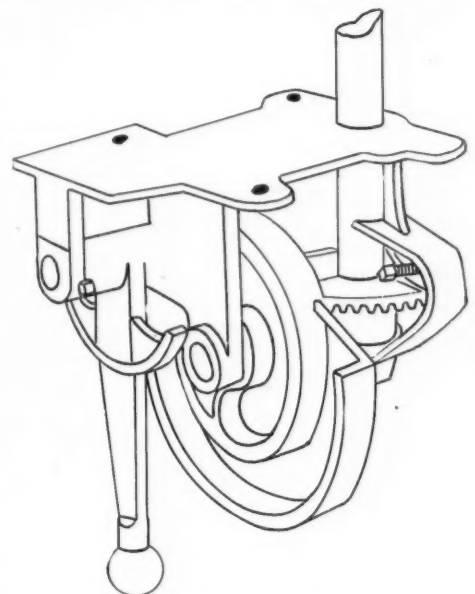


BRENNAN MOTOR AND TRANSMISSION

brackets or base so that it may be fastened with ample clearance to clear the periphery of the balance wheel. The cylinders, valve chamber and water jackets are cast in one piece. All cylinders and valves are made to standard gauges. The connecting rod is made of forged steel and has interchangeable bronze bushings both at the pitman and wrist ends. The carbureters shown are of the float feed type.

**EDWIN L. SMITH**—Boston comes to the front with what is termed the I. M. C. automobile steering check. On the lower end of the steering wheel post is a bevel gear, which meshes with another attached to an eccentric cam track, which in turn operates a cam attached to the arm which connects the rod leading to the steering knuckle. It is similar in action to the cam and track of a Gordon printing press. While it is easily operated, there seems to be little chance for movement through the wheels turning. The entire gear is enclosed in an aluminum case, making it practically dust proof.

**THE SCOVILLE & PECK Co.**—The exhibit is of oil and acetylene lamps, the former in three patterns and the acetylene in self-contained and separate generator patterns. The Standard oil lamps, large size, are made as side lights for touring cars; the style F, as side lights for runabouts, and the tail lamps, for touring cars. All the lamps are of tubular type of



I. M. C. STEERING CHECK

construction and allow of fresh air being carried direct to the burner. The acetylene headlights are heavy, the carbide holder and generator being made of heavy brass tubing, instead of sheet metal. The reflectors are turned out of solid silver on lathes and fitted to templates to insure accuracy in reflection. The independent generator lamps are made on the same general lines and of the same bright material. The generators are supplied with brackets so they may be mounted on the dash if desired. The gas, when shut off, automatically closes the water supply, thus preventing further generation until the gas is turned on again.

**STANDARD CARRIAGE LAMP Co.**—The line of lamps shown comprises side and tail lamps in popular forms and several patterns of big acetylene headlights. A line of neat electric side, tail and headlights are also shown.

**ELECTRIC CONTRACT Co.**—This exhibit contains a complete line of the Star hand lamps and the E. R. G. ignition batteries.

# MOTOR AGE

Published Every Thursday by  
THE TRADE PRESS CO.

1303 MICHIGAN AVENUE CHICAGO  
Telephone Calumet 7011

New York Office, 134 West 28th Street.  
London Office, American Publication Bureau,  
58 Manor Park Rd., Harlesden, N. W.



Entered at the Chicago Post Office as Second  
Class Mail Matter

Subscription, Two Dollars per Year  
Foreign Subscription, Four Dollars

Any Newsdealer may obtain Motor Age through  
the Western News Co., Chicago, or any  
of its branches, on a returnable basis

## HORSEPOWER NOT ALL



VEN a casual observer of the automobile trade in France must have noticed that a decided change has taken place in the manufacture of motor cars in that country. Instead of giving almost all their attention to the production of racing cars, or to putting on the market touring cars of racing form, but with a few accessories which are not required on the kilometer trial car, the French manufacturers have entered seriously and earnestly the field for which automobiles are really most wanted and needed.

Heretofore many makers have expressed in action the thought that because a relatively great number of people bought cars having 40, 80 or even 100 horsepower, that this was the most desirable line to make, that most of the people who could afford to pay for an automobile wanted these touring-racers, these locomotives. There has, of course, always been a demand for smaller cars and the manufacturer generally had a few toy machines of 6 to 8 horsepower. A few makers also had cars listed at 10 to 12 horsepower, but few had anything to offer between the two extremes—the very low and the very high power cars.

The public is asking for more convenient cars. It has liked the racers and the big cars that were made for touring at railway speed; but it has awakened to the desirability of the real pleasure car of moderate power, with large and convenient seats, with a top, with ample mudguards and with long wheel base and big tires. A demand has been created so rapidly that it has become evident to the manufacturers that the public's taste has changed, and changed decisively.

This change in the people's taste and the manufacturers' desire to recognize it has been nowhere more evident than at the show in Paris last month; especially when the cars there exhibited are compared with those at the show of 1902. In 1902 there were more racing cars and chassis of racers exhibited than last month, and there were also many more high powered touring cars, while there was almost none of the comfortable, small pleasure car style, with tops or limousine body. The majority of the makers listed three or four sizes, the

majority of which were above 24 horsepower.

At the show of December, 1903, taking as a basis forty-four of the leading French manufacturers exhibiting at the salon, twenty-four of them displayed 12-horsepower cars, seventeen 16-horsepower cars, thirteen 20-horsepower cars, fourteen 24-horsepower cars, nine 30-horsepower cars, three 35-horsepower cars, eight 40-horsepower cars, and two 45-horsepower cars. The only three 60-horsepower cars shown were of foreign manufacture, while the only 80-horsepower French car was equipped as a racer adapted to touring purposes.

It appears, furthermore, from the cars displayed, that 40 horsepower is about the limit for big touring cars, while several of the most prominent concerns that heretofore dealt almost exclusively in heavy cars have come to the front with 6 and 8 horsepower light cars. Taking the exhibition as a whole, 12, 16 and 18 horsepower cars predominate, and in the strictly heavy class of luxurious touring cars with coupe, limousine and other stylish bodies the majority are of 24-horsepower.

It cannot be otherwise than that there is a reaction in favor of more conservative construction. French makers are paying more attention to meeting the conditions of road travel and less to the requirements of speed. It has been found that excessive power is not necessary to propel even a six or seven-passenger car over the roads at a brisk touring gait; and the public and the makers have been sensible enough to appreciate the fact that the provision of more than ample power is an unnecessary and wasteful proceeding. Racing cars have come to be looked upon as constituting the minority division of the country's production; as chiefly of service to manufacturers as advertising mediums, and not greatly important in the retail market. Briefly, France is trading the spectacular for the useful.

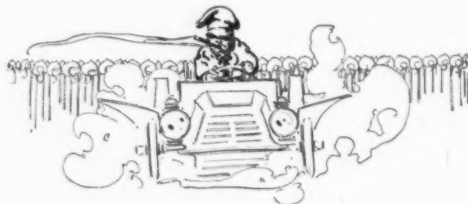
## CHILD-LIKE INNOCENCE



problems and surmount difficulties, and the manufacturer may thereby be vindicated in his catalogue claims.

A few days ago an angry customer went into a supply store in Chicago and vigorously scored the salesman because the automobile lamp he had purchased a few weeks before was not working satisfactorily. He said the light was so poor that he had to strike a match to see if it was going.

The sarcasm of his remark was all lost on the salesman, who was busy taking the lamp apart. In a few minutes he displayed the inside of the lamp all clogged with dirt, mute evidence that the owner had never attempted to clean it. The deposit was removed and the



lamp burned again with its wonted brilliancy. The crestfallen customer acknowledged that "he hadn't thought of cleaning it," and said he would investigate more the next time before making complaint.

The same salesman told of another customer whose kerosene lamp refused to produce any light. The suggestion was made that the lamp needed kerosene. The customer "hadn't thought of that," and investigation discovered the reservoir quite dry. The kerosene solved the mystery and the lamp was again "a good lamp."

From these incidents it may be deduced that by the proper manipulation of the organs of thought by the user of the article, the long-suffering manufacturer will escape much unmerited blame.

Still the manufacturer has no occasion to go to sleep in his own righteousness. Today is a day of progress.

## THE BROWNLOW BILL



CONGRESS will within the next 3 weeks consider the passage of the Brownlow bill appropriating \$24,000,000 as national aid for the building of good highways. This bill was introduced over a year ago. Its provisions are practical and it would result in the expenditure of \$48,000,000 in the construction of wagon roads throughout the country. It is one of the natural results of the long pending good roads movement.

The advocates of good roads have toiled for years and have accomplished much direct good of a local character. They have created a popular desire for better highways. They have changed the sentiment of the farmer and made him know the selfish advantages he will derive from good roads. They have sought to join the hundred and one interests affected by the condition of the highways. They have, in a measure, brought the nation's legislators to a realization of the past backwardness of the United States in road making and maintenance, and of the almost absolute necessity of sweeping reform.

The time is ripe for decisive action on a big scale. The Brownlow bill meets the requirement of the time in the two respects of putting upon the nation some of the burden of building the nation's highways and stimulating the states to renewed and greater efforts toward the improvement of their roads individually. Briefly the bill provides as follows:

1—For the creation of a department at Washington, with proper superintendents and employees, to take care of the building of these roads.

2—The \$24,000,000 to be appropriated is available at the rate of \$8,000,000 a year for 3 years, and is to be divided among different states according to their population, except that no state is to receive less than \$250,000 of this money.

3—Each state, county or town receiving federal aid must add a like amount to the sum received from the United States government.

4—Should any state not take the amount allotted to it under this law before January 1, 1907, all such amounts not taken up are to be re-allotted in proportion to the population





of the different states which have taken up their entire allotment.

5—A like amount must be added by the states or counties receiving aid, so that \$48,000,000 are to be spent on roads. This distribution by the number of inhabitants is far more equitable than the distribution of some \$32,500,000 a year under the rivers and harbors bill, which goes principally to the seaboard states and to the Mississippi delta.

The complete bill was published in *MOTOR AGE* about a year ago. It may on first thought seem extravagantly framed, but when one stops to consider the vast sums which the government has spent in other improvements, it is not extravagant to plan for the spending of \$24,000,000 after a hundred years and more of wretched roads.

France has 23,603 miles of improved roads, built and maintained by the government. Other countries in Europe have long since realized the necessity of the government assisting in highway improvement. It is consistent that the government should do so if for no other reason than that road improvement is the one public improvement which affects the greatest number of interests.

Among these interests is that of automobilizing, and just as it is readily shown that the duty of the government to assist in advancing the interests so affected, it is equally apparent that automobilists and every other class of road users owe themselves the selfish duty of using whatever influence they have in helping to bring about the passage of such a measure as the Brownlow bill.

The users of the road for pleasure purposes have always been foremost in good roads advocacy on account of that strange perverseness of human nature whereby those who would be most materially benefited by good roads were for years the very ones to most protest against extraordinary expenditure to get them. This feeling, happily enough, has changed, and the different communities of the country are in a mood receptive of encouragement.

The automobilists of America have the best opportunity they have ever had to work directly and effectively, and through the other interests to which good roads are advantageous. They should not procrastinate in taking action which will assist the passage of the Brownlow bill. As clubs and as individuals let the motorists of the country do what they can and let them do it quickly and vigorously.

#### MOTOR BOOK WANTED



ENOUGH matter has been written and published concerning automobiles to stock a small memorial library. Yet there is practical need of a book on automobile construction, which has never been filled. There are three classes of books on automobile subjects—

those which are so abstruse as to be incomprehensible to all but the technically educated man; those which contain absolute rot or antedated information or other poorly selected subject matter; and those which con-

tain good, standable information, but which lack arrangement, making it utterly impossible to use them as books of reference.

There are books which contain convenient formulas, but whose language is so veiled in higher mathematics and technical terms as to be useless to all but the expert designer, who is supposed to know these same things himself. There are other books which are supposed to cover the general subject of automobiles, and which laboriously describe systems of construction several years out of date at the time of publication. There are still other books which deal in automobile care, repair and maintenance in a popular manner, but in which the reading matter has not been arranged by any system whatever, and is so badly mixed and jumbled that it would be absolutely impossible to correct and completely index it.

Few men in automobilizing care to read a semi-technical book as they would a novel. The greatest usefulness of such a work is for reference. Motoring has need of a hand book

of motor car information which is clearly and plainly written, in which all mathematical problems are reduced to their simplest possible forms and in which the matter is carefully and intelligently arranged and fully indexed.

This work ought to touch upon the general subject of the principles of automobile construction; current practice; present the most practical rules for working out the more common problems of automobile design; enumerate the possibilities of trouble in the use of a car, and tell the best known ways of locating and remedying such troubles; and give practical advice concerning the care and use of automobiles.

It would be no small task, the writing and compilation of this work; but if there has been any profit whatever in the writing and publishing of other works of a similar nature, there should be substantial profit in making this one which is so much needed.

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The present year promises to be one of rejoicing both for horses and lovers of horses. The noble animal will witness his emancipation from drudgery and hard work to an extent that will be truly amazing. The motor this year will "get down to business" and take its rightful place in practical business life. The transfer of heavy freight will be by motor, the merchants have begun to deliver dry goods and groceries by motor and even the farmer to plow by motor. The time is come for the practical adaptation of the motor car to everyday vocations. The adoption of the automobile in business will probably be limited this year only by the output of the factories making such cars. This year will rank as the first of the commercial motor vehicle era.

\*\*\*

Concerning automobiles and the possibilities of introducing American machines in Switzerland, an American consular officer says that one of the largest American firms making automobiles has, since last February, sold about sixty such machines in Switzerland. The head of the agency is at Zurich, and there is a sub-agency at Geneva. There are now two successful automobile factories in Switzerland, one in Frauenfeld and the other in Berne; the first is said to have sold its entire production for this year in England.

\*\*\*

An English statistician has figured that by the substitution of motors for horses in agriculture the saving would be \$30,000,000 in Great Britain alone. He says that eight men and a motor can reap and thresh 10 acres a day, while under the present system it takes thirty men, two boys and nine horses to do the same work. The cost of corn cultivation is estimated at \$3.10 per acre by horse labor and \$1.40 by motor.

\*\*\*

Ford's mile on the ice, Ford himself, and the big 999 machine are as much talked about and as much criticised as anything. Whatever turn may be taken, the mile will not long remain if it is a possible thing to push it out of the way. Every concern which pretends to build anything capable of speed now has the mile straightaway record bee buzzing in its bonnet.

### A GHOST OF LONG AGO

Looking backward from the year 1950 Aloysius Coll, in the New York Sun muses on "The Old Automobile" as follows:

Out there in the sun and rain it stands,  
A ghost of the long ago;  
In the summer blistered by the heat,  
In the winter white with snow;  
In a heap of rusty scrap forlorn,  
Where the nettlewort is high,  
It rests so silent and so still,  
In the dreams of days gone by.

A field mouse nests in the moldy bed;  
A hungry grasshopper steals  
The scaling paint, and a spider weaves  
A web on the ancient wheels;  
And sometimes, up on the shaky seat  
Alights a curious crow—  
Some old chauffeur to his place returned,  
A ghost of the long ago!

And sometimes little children climb  
Up into the rickety thing,  
And make believe that they speed away,  
As they laugh and shout and sing;  
And then I dream of a day gone by,  
And the old wheels catch the thrill  
Of the day my old sweetheart and I  
Went dashing down a hill!

The rusty rods, and the chains and tires—  
Ah, grandfathers are they  
Of the fleet steeds that thunder by  
On the smoother roads today!  
But it must sit—as I do here,  
An old and worn-out man,  
And dream of the scenes of long ago,  
And the races that it ran!

In a heap of scrap and nettlewort  
Half-hidden from the eye,  
It stands forlorn and silent, while  
The years are passing by;  
In the summer blistered by the sun,  
In the winter hear with snow—  
Out here with me in the last long stop—  
And the dreams of long ago!

## FRENCH ARE ARROGANT

**Over-Confidence Renders Them Blind to Motor Car Requirements in Countries to Which They Sell Continuously—Good French Roads Do Not Furnish Severe Tests of Automobiles**

An official of the Austrian Automobile Club, who is one of the leading dealers in Vienna, has made several interesting remarks concerning the French manufacturers' methods of doing business with foreigners. He gave his opinion conditionally that his name would not be mentioned.

After stating that France leads all nations in the manufacturing of automobiles, that its cars are in great demand and that the agents for the French makers were doing a splendid business, the Austrian authority continues as follows:

"This brilliant and satisfactory condition should, however, not prevent French manufacturers from giving attention to the requirements of foreign markets, or they will certainly have to repent for their independence ere long.

"It is no mystery that the French makers do not care to find out what foreigners wish and need; they don't care to inquire, or even to see for themselves; they have the bad tendency of thinking that everything that is found satisfactory in France should prove so in foreign lands. This idea may lead to disastrous mistakes, which may not be easily remedied after they have been going on for a certain time.

"Everybody knows that the French roads are the finest in the world, but why do French manufacturers think that because their cars give the very best satisfaction on the roads of their country, that they ought for this reason to give fully as good a service on foreign roads?

"This is a mistake on their part, which they ought to have been able to have found out long ago. The springs and axles which are fitted to their cars are all right for the Paris-Bordeaux road, but they are not all right for the rocky, rough, primitive paths of Russia, or the miserable thoroughfares of some parts of Austria. The same remark fits also the conditions in the majority of other countries. There are other parts of French cars that are not up to the needs of foreign countries, however satisfactory they have proven themselves to be in the home country.

"The troubles dealers have in handling French cars are sometimes very aggravating. It happens frequently that when a French car arrives everybody admires its beautiful bodywork, its fine finish, its elegant design. Much is naturally expected of it. But before the car has been actually in a severe, or even a mild test, it is noticed that the springs are too weak; that the ribs do not resist the shocks of the roads; that the base of the car is too near the ground. Disappointment of the keenest kind follows; complaints are made before the brand new car has been in the hands of the dealer 24 hours; the latter naturally communicates with the maker, and generally receives word that the various unsatisfactory points will be remedied if the car is sent back. Instead of making all the desired changes, however, the French maker either makes none or so few, and such ones of minor importance that when the car returns after a long delay, the dealer and his prospective buyer are no

more satisfied than before. Generally the dealer receives a long explanatory letter in which the maker tries to explain that the points referred to are all right and that the dealer and the buyer will find out soon that the car will give just as good satisfaction as in France.

"The result of all this is that the dealer very often loses customers and that he will look to other countries for his supply of cars. Most of the time the Germans profit by this, because, although their cars are generally not as elegant, as well finished or as a whole up to the French standard in a mechanical way, they at least will make them as ordered. Furthermore, they have some models which have been made so as to come within the requirements of foreign countries. Here again one must recognize the commonsense of the German maker, who studies and becomes well posted in what the other people want and need.

"When asked why he does not make cars, or changes on cars to suit the foreign demands, the French manufacturer generally says: 'What is the use of going to the trouble to change the designs, when the home market takes the entire output?' Of course, this means that the French makers would not have to do business with foreign countries, but while some might think that the argument is safe, it will certainly be different once there is an overproduction. They will then find that others have taken their place.

"This is not simply my personal view, but I feel confident it expresses that of hundreds of other dealers all over the world. The trouble is," added the Austrian dealer, "that nobody ever persists in calling the French makers' attention to these points. Those who really favor its products could not render the French trade a better service than by telling of the shortcomings and the requirements."

### TRANSMISSION DISCUSSED

Boston, Jan. 20—In the third lecture of the gasoline car series before the automobile school of the Boston Y. M. C. A. last night the speaker dealt principally with the different forms of speed changing mechanism and methods of transmission of the power to the driving wheels, and spoke of the two special arrangements which are necessitated in the application of the gasoline motor to road vehicles—first, a friction clutch or some equivalent device for connecting and disconnecting at will the power from its work; and second, a change of ratio between the motor speed and the driving wheel speed capable of being regulated at will and producing the effect of absorbing at one turn of the traction wheels the power of a greater or less number of engine turns dependent upon the conditions to be negotiated.

It was pointed out that almost all the combinations of mechanism by which it is possible to secure varying speed ratios between a driving and a driven shaft have been tried with a view to their application in mechanical traction, and that a number of widely differing forms are actually in use for the purpose. Among the methods of speed variation used are stepped pulleys and belts, the separate clutch system,

sliding gears, the sliding key system, planetary combinations and the friction drive. The use of belts was spoken of as obsolete. The separate clutch system, employing gears always in mesh, was described and its advantages and defects pointed out, and the sliding key method, which bears some resemblance both to the separate clutch method and the sliding gear system, was described and commented upon. The sliding gear system, known also as the Panhard or clash gear system, which is so popular at the present time, was discussed and its good and bad points dwelt upon. The planetary gear, so generally used in light runabouts and which has the advantage of a direct drive on the high speed, was illustrated and explained and some of its weak points as well as good qualities discussed.

Allusion was also made to the friction drive by which an indefinite number of speed graduations may be secured. This method has never taken an important place in the industry. The necessity which calls for the use of the differential gear and its construction in two of its typical forms were explained and the attention was called to the several ways in which the power may be transmitted to the traction wheels. The live axle, with sprocket gearing or bevel gearing, and the solid axle with double chain drive were briefly discussed.

### SKEPTICS IN THE EAST

New York, Jan. 16—The great drop in the mile record figures by which Henry Ford cut off 6 3/4 seconds from the previous record of 46 seconds made by M. Augieres, caused some of the Eastern automobilists to doubt its accuracy, and the A. A. A. racing board asked that a surveyor's certificate of the distance of the course, details of the method of timing and affidavits of the timers be sent to the board. If this time is shown to be regular it will possibly be placed in a category by itself and not classed with records made on land, thus making it similar to wind shield records in trotting and cycling.

J. M. Colquhoun, one of the six men who timed the event, said that the three watches at the start were exactly the same. At the finish one of the watches was fast one-fifth of a second, and the time of the two pieces that agreed was accepted. Before the machine was started a test of the six watches was made. All were snapped to the fraction of a second, and agreed exactly, and 28 minutes later they were stopped, and all were exactly alike. The one watch differing from the other two at the finish Mr. Colquhoun thinks may have been due to some mistake in stopping it.

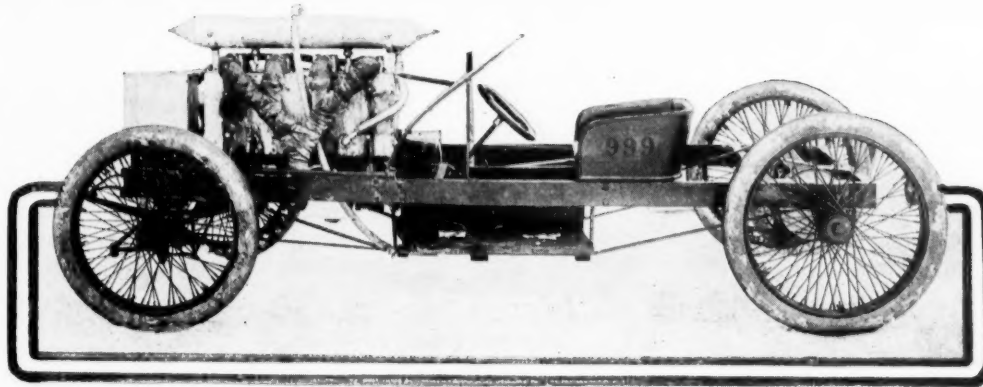
### PACIFIC COAST EXPRESS

San Francisco, Cal., Jan. 13—A corporation called the California Auto Express Co. has been organized here to carry on an express service in San Francisco and the surrounding country. The company will contract for general parcel delivery with business houses, and will also provide an automobile omnibus service to hotels and other points about the city. A storage and repair department will be maintained, and later on a cab service will be put in operation. R. Emerson Warfield will be the president and business manager of the company. The other directors are H. W. France, secretary; E. C. Peck, treasurer; J. H. Goodman, James W. Field, D. T. Ray and G. C. Bowman. The present indications are that the company will do a big business.



# BRISK COMPETITION AT FLORIDA TOURNAMENT

Most of the Prominent Racers Enter the Scheduled Events—Record Breaking Almost Sure—W. K. Vanderbilt, Oldfield and Ford Head the List of the Speed Stars



MOTOR AGE

The Reconstructed Ford Racer 999

New York To Send a Large Force of Contestants and Enthusiasts—The Cars and Men Seen at Last Summer's Track Meets Will Be On Hand—The Programme and the Entrants

The entries in the Daytona-Ormond automobile race tournament closed Saturday with nearly every fast automobile in this country on the list. The only entry received too late for the regular event was that of Dominick Lamberjack, with a Clement car, and he may take part in the record trials. Henry Ford and his record breaker may also be entered in these trials. The principal events will take place on the first three days, and on the succeeding days will occur the special record trials at all distances. There will also be competitions for motor cycles, runabouts and vehicles in special classes. The principal events are as follows:

## FIRST DAY, JANUARY 28

One mile championship, American Automobile Association; free for all.

Owner.	Machine.	H. P.	Cyl.	Weight	Driver
W. K. Vanderbilt, Jr., Mercedes...	90	4	2,000	Owner	
B. M. Shanley, Jr., Decauville....	40	4	1,600	F. Fredericks	
H. L. Bowden, Mercedes.....	60	4	2,375	Owner	
S. B. Stevens, Mercedes.....	60	4	.....	Owner	
F. A. La Roche, Darracq.....	40	4	1,570	Owner	
W. G. Brokaw, Renault.....	30	4	1,600	M. Bernin	
A. Winton, Winton.....	70	8	2,000	B. Oldfield	
Peerless Motor Car Co., Peerless...	70	4	2,000	Joseph Tracy	
W. C. Baker, Baker electric.....	.....	.....	.....	Owner	

One mile, open only to vehicles which have no record for a mile in better time than 1:15

L. Bowden, Stanley.....	5	800	Owner
G. Brokaw, De Dion-Bouton.....	8	750	N. M. Fowell
F. A. La Roche, Darracq.....	40	1,570	Owner
Louis S. Ross, Stanley.....	6	800	Owner
Walter Christie, Christie.....	30	1,275	Owner
J. Insley Blair, Panhard.....	35	1,750	M. W. Ehrlich

Ten miles handicap—Class A and B					
B. M. Shanley, Jr., Decauville....	40	4	1,600	E. Fredericks	
W. G. Brokaw, De Dion-Bouton....	8	4	750	N. M. Powell	
S. B. Stevens, Mercedes.....	4	.....	Owner		
W. G. Brokaw, Renault.....	30	4	1,600	M. Bernin	
F. A. La Roche, Darracq.....	40	4	1,570	Owner	
H. L. Bowden, Mercedes.....	60	4	2,375	Owner	
William Wallace, De Dietrich.....	30	4	2,460	Owner	
J. Insley Blair, Panhard.....	24-35	4	1,750	M. W. Ehrlich	
Walter Christie, Christie.....	30	4	1,275	Owner	

Five miles invitation, open only to gentlemen amateurs—Class B vehicles					
W. K. Vanderbilt, Jr., Mercedes...	90	4	2,000	Owner	
B. M. Shanley, Jr., Decauville....	40	4	1,600	Owner	
S. B. Stevens, Mercedes.....	60	4	.....	Owner	
W. G. Brokaw, Renault.....	30	4	1,600	Owner	
James L. Breese, Mercedes.....	40	4	2,200	Owner	
Louis S. Ross, Stanley.....	6	2	800	Owner	
H. L. Bowden, Stanley.....	5	.....	800	Owner	
William Wallace, De Dietrich.....	30	4	2,460	Owner	
J. Insley Blair, Panhard.....	24-35	4	1,750	Owner	

One mile against the record—Class A and B					
W. K. Vanderbilt, Jr., Mercedes...	90	4	2,000	Owner	
B. M. Shanley, Jr., Decauville....	40	4	1,600	E. Fredericks	
H. L. Bowden, Mercedes.....	60	4	2,375	Owner	
W. G. Brokaw, Renault.....	30	4	1,600	M. Bernin	
Louis S. Ross, Stanley.....	6	2	800	Owner	
J. Insley Blair, Panhard.....	24-35	4	1,750	M. W. Ehrlich	
Walter Christie, Christie.....	30	4	1,275	Owner	
A. Winton, Winton.....	70	8	2,000	B. Oldfield	
Peerless Motor Car Co., Peerless...	70	4	2,000	Joseph Tracy	
W. C. Baker, Baker.....	.....	.....	.....	Owner	
H. L. Willoughby, Autocar.....	10	.....	.....	H. L. Willoughby	

## SECOND DAY, JANUARY 29

Five miles; free for all—Class A					
W. K. Vanderbilt, Jr., Mercedes...	90	4	2,000	Owner	
B. M. Shanley, Decauville.....	40	4	1,600	E. Fredericks	
H. L. Bowden, Mercedes.....	60	4	2,375	Owner	
F. A. La Roche, Darracq.....	40	4	1,570	Owner	
W. G. Brokaw, Renault.....	30	4	1,600	M. Bernin	
William Wallace, De Dietrich.....	30	4	2,460	Owner	
Walter Christie, Christie.....	30	4	1,275	Owner	
A. Winton, Winton.....	70	8	2,000	B. Oldfield	
Peerless Motor Car Co., Peerless...	70	4	2,000	Joseph Tracy	
W. C. Baker, Baker.....	.....	.....	.....	.....	

Fifty miles, A. A. A. championship, open to all classes; 1,000 pounds and over; prizes to winners of both Class A and B

Owner.	Machine.	H. P.	Cyl.	Weight.	Driver
W. K. Vanderbilt, Jr., Mercedes...	90	4	2,000	Owner	
H. L. Bowden, Mercedes.....	60	4	2,375	Owner	
S. B. Stevens, Mercedes.....	60	4	.....	Owner	
F. A. La Roche, Darracq.....	40	4	1,570	Owner	
W. G. Brokaw, Renault.....	30	4	1,600	M. Bernin	
J. Insley Blair, Panhard & Levassor.	24-35	4	1,750	M. W. Ehrlich	
Walter Christie, Christie.....	30	4	1,275	Owner	
A. Winton, Winton.....	70	8	2,000	B. Oldfield	
Peerless Motor Car Co., Peerless...	70	4	2,000	J. Tracy	
W. C. Baker, Baker.....	.....	.....	.....	Owner	
One mile invitation, open only to gentlemen amateurs—Class B vehicles					
W. K. Vanderbilt, Jr., Mercedes...	90	4	2,000	Owner	
B. M. Shanley, Jr., Decauville....	40	4	1,600	Owner	
H. L. Bowden, Stanley.....	5	.....	800	Owner	
S. B. Stevens, Mercedes.....	60	5	.....	Owner	
W. G. Brokaw, Renault.....	30	4	1,600	Owner	
James L. Breese, Mercedes.....	40	4	2,200	Owner	
Louis S. Ross, Stanley.....	6	2	800	Owner	
William Wallace, De Dietrich.....	30	4	2,460	Owner	
J. Insley Blair, Panhard.....	24-35	4	1,750	M. W. Ehrlich	
Five-mile handicap—Classes A and B					
B. M. Shanley, Decauville.....	40	4	1,600	E. Fredericks	
H. L. Bowden, Mercedes.....	60	4	2,375	Owner	
S. B. Stevens, Mercedes.....	60	4	.....	Owner	
F. A. La Roche, Darracq.....	40	4	1,570	Owner	
W. G. Brokaw, Renault.....	30	4	1,600	M. Bernin	
W. G. Brokaw, De Dion-Bouton....	8	2	750	N. M. Powell	
William Wallace, De Dietrich.....	30	4	2,460	Owner	
J. Insley Blair, Panhard & Levassor.	24-35	4	1,750	M. W. Ehrlich	
Walter Christie, Christie.....	30	4	1,275	Owner	
Seventh event—One mile, 1:05 class—Class A					
H. L. Bowden, Daimler.....	60	4	2,375	Owner	
F. A. La Roche, Darracq.....	40	4	1,570	Owner	
J. Insley Blair, Panhard.....	24-35	4	1,750	M. W. Ehrlich	
Walter Christie, Christie.....	30	4	1,275	Owner	

## THIRD DAY, JANUARY 30

Ten mile championship A. A. A.; free for all—Class A					
W. K. Vanderbilt, Mercedes.....	90	4	2,000	Owner	
B. M. Shanley, Jr., Decauville....	40	4	1,600	E. Fredericks	
F. A. LaRoche, Darracq.....	40	4	1,570	Owner	
W. G. Brokaw, Renault.....	30	4	1,600	M. Bernin	
Walter Christie, Christie.....	30	4	1,275	Owner	
A. Winton, Winton.....	70	8	2,000	B. Oldfield	
Peerless Motor Car Co., Peerless...	70	4	2,000	Joseph Tracy	
W. C. Baker, Baker.....	.....	.....	.....	Owner	
One mile 56 seconds class—Class A					
S. B. Stevens, Mercedes.....	60	4	1,900	Owner	
F. A. La Roche, Darracq.....	40	4	1,570	Owner	
W. G. Brokaw, Renault.....	30	4	1,600	M. Bernin	
B. M. Shanley, Jr., Decauville....	40	4	1,600	E. Fredericks	
H. L. Bowden, Mercedes.....	60	4	2,375	Owner	
William Wallace, De Dietrich.....	30	4	2,460	Owner	
Walter Christie, Christie.....	30	4	1,275	Owner	
Ten mile invitation, open only to gentlemen amateurs—Class B vehicles					
W. K. Vanderbilt, Jr., Mercedes...	90	4	2,000	Owner	
Twenty-mile handicap—Classes A and B					
B. M. Shanley, Jr., Decauville....	40	4	1,600	Owner	
H. L. Bowden, Stanley.....	5	.....	800	Owner	
S. B. Stevens, Mercedes.....	60	4	.....	Owner	
James L. Breese, Mercedes.....	40	4	2,200	Owner	
W. G. Brokaw, Renault.....	30	4	1,600	Owner	
William Wallace, De Dietrich.....	30	4	2,460	Owner	
J. Insley Blair, Panhard.....	24-25	4	1,750	Owner	
Walter Christie, Christie.....	30	4	1,275	Owner	
B. M. Shanley, Jr., Decauville....	40	4	1,600	E. Fredericks	
H. L. Bowden, Mercedes.....	60	4	2,375	Owner	
S. B. Stevens, Mercedes.....	60	4	.....	Owner	
F. A. La Roche, Darracq.....	40	4	1,570	Owner	
W. G. Brokaw, Renault.....	30	4	1,600	B. Bernin	
W. G. Brokaw, De Dion-Bouton....	40	4	1,570	N. M. Powell	
William Wallace, De Dietrich.....	40	4	2,460	Owner	
J. Insley Blair, Panhard.....	24-25	4	1,750	M. W. Ehrlich	
Walter Christie, Christie.....	30	4	1,275	Owner	
Mile and kilometre record trials—Classes A and B					
William K. Vanderbilt, Jr., Mercedes	90	4	2,000	Owner	
H. L. Bowden, Mercedes.....	60	4	2,375	Owner	
Louis S. Ross, Stanley.....	6	2	800	Owner	
William Wallace, De Dietrich.....	30	4	2,460	Owner	
J. Insley Blair, Panhard.....	24-35	4	1,750	Owner	
Walter Christie, Christie.....	30	4	1,275	M. W. Ehrlich	

Messrs. Oldfield, Baker, Tracy and others will also try for these records.

## OVERFLOW EXHIBITION

### Thirty-Five Exhibitors at the Supplementary Show in Herald Square Hall—More Expected Later

New York, Jan. 18—Simultaneously with the opening of the Madison Square Garden exhibition an overflow show, which is to last 2 weeks, began at the Herald Square exhibition hall, which has 65,000 square feet of floor space. Manager Chassaund says he expects a conservative number of garden exhibitors to be added during the second week.

The exhibitors follow:

American Machine Mfg. Co., of Boston; spark plugs and coils.  
 American Automobile Storage Co., of New York; Baker electric cars.  
 The Auto Import Co., of New York; Mercedes, Rochet-Schneider, Renault and Criterium cars.  
 Babcock, Atwood & Bowen, of New York; Buffalo electric, Packard and Yale cars and Seabury automobile boats.  
 The Automobile, of New York.  
 The American Inventor, of Washington, D. C.  
 Clodio & Widmayer, of New York; Cudell and Adler cars.  
 Cushman Motor Co., of Lincoln, Neb.; automobile motors.  
 M. A. Cornell & Co., of New York; Raydient metal polish.  
 Adam Cook's Sons, of New York; lubricants.  
 Geneva Automobile & Mfg. Co., of Geneva, O.; Geneva steam cars.  
 The Horseless Age, of New York.  
 H. S. Harkness, special racer.  
 Highway Alliance of America.  
 Hendee Mfg. Co., of Springfield, Mass.; Indian motor bicycles.  
 Mead Cycle Co., of Chicago; Benz-Parsifal cars.  
 Charles H. Metz, Waltham, Mass.; motor cycles and bicycles.  
 The Motor Car, of New York.  
 Oldsmobile Co., of New York; Oldsmobiles.  
 Palmer Bros., of Coscob, Conn.; automobiles and marine motors.  
 Reading Standard Cycle Mfg. Co., of Reading, Pa.; motor cycles and bicycles.  
 Rockaway Automobile Co., of Rockaway, N. J.; automobile starters.  
 Relay Motor Car Co., of Reading, Pa.; automobiles.  
 C. R. Radcliffe, of New York; U. S. Long Distance automobiles.  
 William Roache, of New York; accessories.  
 Synnestvedt Vehicle Co., of Pittsburg, Pa.; electric cars.  
 St. John Patent Rubber Tire Co., of New York; rubber tires.  
 Schubert Bros. Gear Co., of Oneida, N. Y.; gears and accessories.  
 Kenneth A. Skinner, of Boston; de Dion-Bouton automobiles.  
 Springer Motor Vehicle, of New York; automobiles.  
 Swan Electric Mfg. Co., of New York; semi-dry cell batteries.  
 Springfield Moulding Works, of Springfield, Mass.; portable houses for automobiles.  
 William H. Terwilliger & Co., of Amsterdam, N. Y.; steam vehicles.  
 Tennant Automobile Tire Co., of Springfield, O.; rubber tires.  
 United Motor Corporation, of Pawtucket, R. I.; Cameron automobiles.

### A. A. A. MEETS IN CHICAGO

The American Automobile Association will hold its annual convention at the Coliseum, Chicago, from February 8 to 13, inclusive. The election of officers and directors will be held Thursday, February 11, at 3 o'clock in the afternoon.

The following nominations for officers and directors have been made: President, Harlan W. Whipple, Automobile Club of America; first vice-president, John Farson, Chicago Automobile Club; second vice-president, Judge W. H. Hotchkiss, Buffalo Automobile Club; third vice-

president, Milbank Johnson, Automobile Club of Southern California; treasurer, George Farrington, Automobile Club of New Jersey; secretary, C. H. Gillette, Automobile Club of America; directors, Dr. Julian A. Chase, Rhode Island Automobile Club; A. R. Pardington, Long Island Automobile Club; Samuel H. Valentine, Automobile Club of America; Windsor T. White, Cleveland Automobile Club; Barclay H. Warburton, Automobile Club of Philadelphia; Dr. W. E. Milbank, Albany Automobile Club.

### TO ABOLISH TOLL ROADS

#### New York Assemblyman Introduces Bill Making End of Such Highways—Association Work

Syracuse, N. Y., Jan. 18—Assemblyman Martin L. Cadin has introduced a bill into the New York State legislature to prevent boards of supervisors from renewing the legal existence of plank roads and other toll gate companies. Mr. Cadin has been investigating the subject of toll roads and came to the conclusion that all should be abolished. The measure was suggested by the application of the Cicero Turnpike Co. for a renewal of its charter for 35 years.

In speaking of the measure today Mr. Cadin said: "Toll gates are a relic of a past. They are out of date. They should be abolished, particularly where they are maintained within the corporate limits of a city. With the large appropriations which the state and counties are making annually for the construction of improved highways and in view of the liberal policy which prevails in all communities in relation to the repairs of roadways, the day is fast approaching when every toll gate in the state should be abolished. My bill is but one of many steps that could be taken in that direction. It will prevent these companies securing a lease of life beyond the period for which their present charters extend. I believe that the measure will receive favorable consideration. I will make it one of my preferred bills and exert my best efforts to secure its enactment into law."

Secretary-Treasurer Frederick H. Elliott of the New York State Automobile Association has received responses from the circulars which he sent out concerning the meeting of the association in New York during the show, leading him to believe that there will be a larger attendance than anyone has looked for.

The reduced rates which have been obtained on the railroads will be the cause of many people going to the show who are not members of the clubs but who are interested in automobilism.

### FACTORY AT AUCTION

The plant and factory of Clark Sintz, at Grand Rapids, Mich., will be sold at public auction January 28 by the Michigan Trust Co., trustee. The property consists of machinery, engines, shafting, tools and fixtures used in the factory, and also partly finished automobiles. The property is appraised at \$10,052.11 and will be offered for sale in parcels at first and finally as a whole.

One of the advantages claimed for motorists in fixing the date of the Gordon Bennett race for June 17 is that it will be before the beginning of the social season at Homburg, and there will be plenty of hotel room and lower rates.

## VISITORS MAKE MERRY

### Almost Every Day of Show Week Has Its Meeting and Every Night Its Dinner—Social Events

New York, Jan. 18—A date book is a necessary adjunct to the equipment of the visitor to the show this week if he wishes to attend all the banquets and meetings and conventions prepared by the different powers for his edification and amusement.

On Tuesday the American Motor League stirs up the enthusiasm by opening a convention in the assembly hall at Madison Square Garden. The first day is "good roads day," and the speakers' list includes Senator A. S. Mann, of Florida; George A. Pearre, member of congress from Maryland; Martin Dodge, director of the Government Road Inquiry Bureau at Washington; ex-President A. R. Shattuck, of the A. C. A.; State Highway Commissioners McClintock of Massachusetts, Budd of New Jersey, and MacDonald of Connecticut; and State Engineer Bond, of New York. A stereopticon lecture by Assistant Director M. O. Eldridge, of the Government Road Inquiry Bureau concludes the program.

On Wednesday the program consists of addresses on subjects of general interest to automobilists by Prof. Carpenter, of Cornell; Prof. Hutton, of Columbia; Charles E. Duryea, A. L. Riker, E. W. Roberts, Henry Souther, Alexander Winton and others. The 2 days following will be devoted to forming local and state organizations.

The Automobile Trade Club will give a smoker at the Hotel Navarre Tuesday, and on Wednesday there will be a luncheon by the A. L. A. M. The second annual banquet of the Hyatt Roller Bearing Co. will take place Wednesday evening in Breton Hall.

Thursday is the date set for the special meeting of the New York State Automobile Association at the A. C. A. clubrooms, 753 Fifth avenue. The annual meeting of the N. A. A. M. will be held the same day at Madison Square Garden.

The Mudlarks will recount the experiences, hardships and pleasures encountered on the endurance run at a banquet in Assembly Hall, Madison Square garden, Thursday evening.

The annual banquet of the N. A. A. M. will be held at the Cafe Martin Friday, and on Saturday the A. C. A. will banquet at the Waldorf-Astoria.

### NEW EASTERN CLUB

About twenty of the fifty automobilists of Richmond county, Staten Island, have organized the Richmond County Automobile Club and elected the following officers: President, Charles A. Schultz, Great Kills; vice-president, Dr. William Bryan, Livingston; secretary, J. J. Warrell, St. George; treasurer, David N. Melvin, Port Richmond.

### ORDER CONSERVATIVELY

Syracuse, N. Y., Jan. 18—The Brown-Lipe Gear Co. has completed its new storehouse at its plant in South Geddes street and is in shape to do a much larger business during 1904. H. W. Chapin, the manager, told a MOTOR AGE representative before he left for the New York show that the outlook was excellent. "I notice," said he, "that the orders which we are receiving from manufacturers this year are more con-



servative than last year; they are trying to avoid the mistake which they made in 1903, when several of them ordered wildly and many more than they used. I believe that this year they will use all they order."

At the annual meeting of the stockholders of the New Process Raw Hide Co., which manufactures automobile parts, the following trustees were elected to hold office for the ensuing year: T. W. Meachem, C. L. Stone, Emil Laass, T. G. Meachem, D. E. Petit, A. C. Vosburgh and J. F. S. Meachem. At the trustees' meeting immediately following, the old officers were re-elected as follows: President, T. W. Meachem; vice president, T. G. Meachem; secretary and treasurer, A. C. Vosburgh.

#### NATIONAL AID NECESSARY

##### Senator Latimer Tells Why It Is Imperative That the Government Assist Road Making

Washington, D. C., Jan. 18—The cause of good roads received a decided impetus in the senate of the United States on Thursday, when Senator Latimer, of South Carolina, spoke at length in advocacy of his bill to establish a bureau of highways and to provide for national aid in the improvement of the highways. The details of this bill were published in the last issue of MOTOR AGE. Senator Latimer summed up his reasons why the federal government should aid in improving the common roads, as follows:

First—Because the history of road building demonstrates that a complete system of public roads has never been constructed in any country except by the aid of the general government.

Second—Because the revenues of the government are raised largely upon articles consumed by all the people, thereby distributing taxation equally, and as all the people should contribute to the construction and improvement of the roads, it is only by federal aid that this can be accomplished.

Third—Because it is the duty of the federal government to bear its just proportion of the expense for the construction and improvement of the roads which it uses for the delivery of the mails and for military purposes in time of war.

Fourth—Because better roads are a national necessity; they closely concern the general welfare of the nation and are therefore a proper object of national aid.

Fifth—Because a surplus of about \$260,000,000 is lying idle in the treasury which belongs to the people and should be expended for their benefit in a manner which will accomplish the greatest good to the largest number.

In Senator Latimer and Representative Brownlow the cause of good roads has two staunch advocates in the national legislature and they can be depended on to urge the necessity for the improvement of the national highways and to secure, if possible, federal aid to that end.

#### MITCHELL RE-ORGANIZES

The Mitchell Motor Car Co. has been reorganized with a capital stock of \$300,000, and it will shortly take over the plant of the Wisconsin Wheel Works at Racine Junction, Wis. The company will continue the manufacture of the Mitchell motor cycle and motor cars.

The tires of an automobile should always be pumped up hard.

## TAKES FRESH BREATH

### Chicago Automobile Club Gets Its Second Wind and Will Hustle With Renewed Energy

Chicago, Jan. 19—A new lease of life has been taken on by the Chicago Automobile Club since the inauguration of John Farson as president, and the members are beginning to realize that the club has a rightful place in the social and business life of the city, and that a little vigorous action will do wonders towards revivifying it.

The first move to arouse interest was the smoker given in December. This brought out a large number of the members, and the evening was so pleasantly spent that the united expression was in favor of more entertainment along the same line. This is now being provided for, and the next smoker is announced for Thursday evening, February 4. A more extensive program will be arranged and a large attendance is expected.

At a recent meeting a resolution was passed by which new members joining in January were to be exempt from the payment of dues for 6 months. This inducement, together with the active campaign carried on by the members in seeking applications, has resulted in quite a noticeable increase in the membership list.

Last week a letter was sent to every automobile owner in the city giving some facts regarding the club and telling why it merits interest and support. The letter says that the objects of the club are as numerous as the needs of that portion of the community which indulges in automobiling. An attractive, commodious and well furnished club house is maintained at 243 Michigan avenue, with all the facilities for comfort of a modern club, including drawing rooms, parlors, private parlor for ladies, smoking rooms, sleeping rooms and a cafe and private dining room.

In the rear of the club house is a large garage with accommodations for sixty automobiles, in which members may store their machines 24 hours without charge, or for longer periods for a nominal charge. There is also a repair shop in connection under the supervision of the club and in charge of an expert machinist. Gasoline and lubricating oil can be procured substantially at cost. It is the intention to procure suitable quarters in one or more places out of the city, where members can go in the summer time and enjoy themselves either privately or socially, as they may choose.

The club's assistance is always at the disposal of the members in protecting the interests of the users of automobiles, in all legitimate ways, and one of the principal objects to which it gives its support is the movement in favor of good roads. The club has no desire to add to its ranks members whose sympathies are not in accord with the high standard it has set for itself; it desires the interest of all true lovers of the sport who are disposed to join in every effort which makes for the good of automobiling.

The club deserves the financial support at least, if not the active personal interest, of every owner of an automobile in Chicago.

#### CLUB PAPER SUSTAINED

A strong effort has been made by some members of the Automobile Club of Great Britain to have the club journal discontinued, as the claim was made that the club lost money in its

production and also that it interfered with legitimate trade journals and worked an unnecessary hardship on manufacturers who were called upon to help support it by advertising in its columns. A vote was taken recently and the majority favored the continuance of the journal. An editing committee was also formed and the weekly cost will be increased by additional salaries.

#### CHANGES IN HUB TRADE

##### Several New Agencies Arranged—List of the Exhibitors of Local Show Complete

Boston, Jan. 18—Dowling & Maguire have secured the agency for the Pierce cars in this city. They have taken headquarters on Boylston street in close proximity to the home of the Massachusetts Automobile Club. Heretofore this car has been handled in Boston by Percy Lewis.

Rossell Drisko has received his first sample of the Clement-Bayard car, which, with the Walter, he is to handle this season.

Moore & Smith, agents for the Autocar, have at last secured quarters on automobile row. They will, however, retain their garage privileges in the Park Square automobile station.

A. E. Fuller has been appointed Boston representative for the Packard, which he will handle in connection with the Northern and the Orient.

The arrangements for the automobile show of the Boston Automobile Dealers' Association in Symphony hall the week of March 14-19 are practically complete and everything is in readiness for the exhibit. All the space has been disposed of, and Manager Campbell of the show committee has made public the list of exhibitors, which is as follows:

Kenneth A. Skinner.....	De Dions
J. H. MacAlman.....	Locomobile
Pope Mfg. Co.....	Toledos, Hartfords and Cadillacs
Oldsmobile Co. of New England.....	Oldsmobiles
Moore & Smith.....	Autocars
Columbia Motor Vehicle Co.....	Columbias
Harry Fosdick.....	Wintons
A. T. Fuller.....	Packards and Northerns
A. E. Morrison.....	Peerless
Reed-Underhill Co.....	Knox
Boston Auto Exchange.....	Phelps
Rossell Drisko.....	Clement
E. A. Gilmore.....	Rambler
A. R. Bangs.....	Franklin
Crest Mfg. Co.....	Crestmobiles
A. J. Coburn Co.....	Cameron
G. H. Lowe.....	White
F. E. Randall.....	Stevens-Duryea
Automobile Headquarters.....	
Chester I. Campbell.....	A. A. & P. Co. line
A. T. Fuller.....	Orient
F. G. Reed.....	Yale
Am. Darracq.....	Darracqs
Lock Register Co.....	Wellington
Country Club Car Co.....	Country Club
Hollander & Tangeman.....	F. I. A. T.
Dowling & Maguire.....	Pierce
C. F. Lyman.....	Lyman
C. S. Henshaw.....	Thomas
E. B. Gallagher.....	Richard-Brazier
G. M. Brown.....	Apperson
20th Century Lamp Co.....	Lamps
Continental Caoutchouc Co.....	Tires
Boston Cycle & Sundry Co.....	Accessories
National Oil Heating Co.....	Kerosene burner
S. F. Bowser Co.....	Oil tanks
Gray & Davis.....	Lamps

All of the automobile journals will have exhibits in the hall, while a big display will be made by the automobile class of the Y. M. C. A.

Henri Fournier will sell the Oldsmobile in France.

## NEW HARTFORD GARAGES

### Two Large and Finely Equipped Stations Being Built in the Connecticut Trade Center

Hartford, Conn., Jan. 18—Distinguished in many things, Hartford is soon to be proud in the ownership of one of the largest automobile stations and garages in this country, free of posts and obstructions and located on the street level. Joseph and F. W. Dart and C. A. Kingsley have the work of a great addition to their station well under way. The new building will have a frontage of 40 feet on Trumbul street and will extend 178 feet, there connecting with the station erected last year and measuring 40 by 125 feet. This will give the Palace station nearly 13,000 square feet of floor space, free of posts, all on one floor, with an entrance on Trumbul street and two alley entrances on Church street.

Plate glass frontage will mark the Trumbul street facade and here will be located the repository for the display of the several cars for which the Palace station has the agency. Immediately following is to come the private offices of the managers and the business office for the bookkeeping staff. Next will come two rooms connected, with ornamental grill work, which will be the quarters for the new automobile club that is now being formed.

The aim of the promoters of the club is to make it a social organization, with committees appointed to look into the subject of tours, roadway improvement and subjects of legislation. It is possible that the club will officiate with some of the large bodies in the automobile sport.

Following the quarters of the club will come additional space for the quartering of vehicles. This space will give the station opportunity to more than double its capacity. The machine shop, too, has been given more room and new machinery is daily being installed. As soon as the season starts a force of men will be employed capable of making any repairs necessary to any type of car, with machinery at hand for their speedy and economical working.

The old station is to be changed about somewhat and will contain an enlarged room for ladies who may visit the garage. It is thought that this will be an appreciated feature with ladies who come in from out of town to shop. There will also be quarters for car drivers with wash room, etc. Other features have been suggested and it is likely that the Palace station will add to its equipment so that it will shortly have a paint shop, where the entire work of overhauling a vehicle can be done under one roof.

In its repository the Palace station will have several vehicles, and about the first of March will receive one of the new 22-horse tonneau Locomobiles. Two steam carriages of the same make will also be shown. The Autocar tonneau, the Northern touring car and the Northern runabout will complete the line.

S. A. Miner's Allyn street garage, too, is having its capacity doubled, Captain Miner having taken over the carriage repository of J. P. Allen. This gives Captain Miner plenty of storage space on the lower floor for vehicles and it gives him three floors accessible by elevator for the display of new cars. Another entrance will be put in on the Allyn street front, and it will be so arranged that ve-

hicles will enter by one entrance and exit by another. This will avoid confusion or waiting.

Quarters for ladies and for chauffeurs will be fitted up comfortably. The machine shop space will be increased and a new line of power tools installed. The gasoline and oils supply will be confined in space other than it now occupies, tending to greater safety and convenience. Special lockers for owners of carriages boarding at the station will be provided, with spaces for robes, etc. In the floors above will be displayed the cars for which Captain Miner is agent, the Locomobile and the Knox. The Knox has been a popular vehicle in Hartford ever since its introduction by Brown, Thomson & Co. as a three-wheeler. Several of these early ones are now running on Hartford streets.

### A. L. A. M. WELCOMES CHARLEY

#### Serves Papers of Infringement on Mercedes Agent Immediately Upon His Arrival

New York, Jan. 16—The warfare has begun between the Association of Licensed Automobile Manufacturers and M. Charley, the selling representative of the Daimler Motoren Gesellschaft, the maker of the Mercedes cars. The A. L. A. M. served papers on M. Charley yesterday, charging him with infringing on the Selden patent by bringing unlicensed cars into this country. The association has had the papers in readiness for several days, but held them back until some of the cars brought by M. Charley had been cleared through the custom house. The racing car of W. K. Vanderbilt, Jr., and the brougham of Frederick G. Bourne were cleared Friday. No special cars, however, were mentioned in the papers.

Charley immediately cabled the home office for instructions and then sought his lawyers here for advice. He says he will fight the claims of the association and also take action against all persons selling or purchasing Mercedes cars that do not bear the Mercedes license, which he claims he alone is privileged to give. He says he sells cars to American customers, making the delivery in Paris, and the entry to this country is arranged by the customers. Despite the opposition of the A. L. A. M. he is negotiating with several firms in the United States for the sale of Mercedes cars.

To further complicate matters, a claim has been put forward by Paul La Croix, director of the Société Franco-Américaine d'Automobiles, that his company has a contract with the Daimler company similar to that of M. Charley.

An attorney questioned on the merits of the case told a MOTOR AGE representative that M. Charley could be served with an injunction and would be compelled to put up bonds to cover any possible damage that might be inflicted through his continuing to sell unlicensed cars. An injunction is allowed in patent cases when the alleged infringer is likely to continue to sell after being served with papers in the suit by the plaintiff.

### FORMULA ERROR

In the Readers' Clearing House department of this issue part of a formula for determining the correct compression space or clearance of a motor reads "D equal C—S." It should be "D equal C+S." The mistake was not discovered until after the form containing it had been printed.

## CHAUFFEUR'S CLUB HOME

### Chicago Operators Organize a Pre-tentious Club and Plan a Building in the Motor Rialto

Chicago, Jan. 18—The Chicago Motor Club, the new association of professional operators, held its first meeting last Wednesday evening at the office of the Cadillac Co. of Illinois, 1312 Michigan avenue, and elected the following officers: President, John Conroyd; vice-president, Arthur Sanderson; secretary, William Foreman; treasurer, O. C. Brundage; steward, Frank Brady; directors, Ralph Tucker, Adolph Ulrich, Robert Scott, Charles Riehl, William Becker and E. E. Prye. Twenty-one applications for membership were received at the meeting. The club has received assurances of support and co-operation from nearly every dealer in the city, and the outlook is promising. It is said that a site for a suitable club house will be secured in the near future somewhere in the district bounded by Sixteenth street, Wabash avenue and the lake. Active members must pass a technical examination showing they are qualified to operate cars and make all repairs where no machine work is required. Associate members may be agents, salesmen or anyone interested in automobiles. The club will meet at the Cadillac office every Wednesday evening until it is located in its own quarters.

The stock of Edwin Austrian in the Ralph Temple & Austrian Co. has been purchased by Ralph Temple and the name will be changed to the Ralph Temple Automobile Co. Mr. Temple has been in the automobile business in Chicago for 3 years, opening one of the first houses for the retail sale of automobiles in the city. During the coming year he will handle several makes of gasoline cars, a line of electrics, and possibly a steam car. The company will remove in the spring from 295 Wabash avenue to the new building which is being erected on Michigan avenue nearly opposite the Logan monument.

The Knox Automobile Co., of Springfield, Mass., has opened a branch in the Ludington building, 531 Wabash avenue, next door to the Dan Canary Automobile Co. George A. Crane is manager of the new store.

H. Paulman, manager of the Chicago Automobile Repository Co., at 285 North State street, has closed a contract to enlarge the garage of the company so that it will have a capacity of about sixty machines. This company has the agency for the Pierce cars for Illinois and Wisconsin. Joseph V. Lawrence, formerly with the Ralph Temple & Austrian Co., is now associated with the Chicago Automobile Repository Co., and will devote his time particularly to the sale of Pierce cars.

The Holsman Automobile Co., of Chicago, has increased its capital from \$20,000 to \$50,000.

The Fredonia will be sold this year from 1303 Michigan avenue by the Western Automobile Co. with John R. Bensley as manager. Edmund F. Dodge, who sold the Fredonia last year, will retain his interest in Fredonias, however, as he is the principal stockholder in the new company.

### MOTOR TAPPING

Sometimes it will be noticed that the engine, which has been running perfectly well and easily, will begin to make a slight tapping sound. It is not sufficiently pronounced to be called a knock, and very often it will puzzle the



driver to know what it is caused by, as he is apt to, and he will in the majority of cases, put it down to some slight peculiarity of his valves. As a matter of fact, it is nothing of the kind, but it is due to very slightly premature ignition. Of course, when an engine begins to labor with the ignition too far advanced, there is no doubt whatever as to the cause; but the comparatively light tap caused by only very slight premature ignition is not usually recognized as the first symptom of too early firing.

#### TEST MOTOR ROAD TRAIN

New York, Jan. 19—Hardly a day passes that the matter of heavy power for trucking purposes is not seriously considered by concerns which have depended upon horses for transportation; day by day it is shown that the power truck in some form is being put into the commercial world, so that the prophecies made only a few years ago are now rapidly being realized.

The Gibbs Engineering & Mfg. Co., of Glendale, L. I., has just finished a traction engine and train of cars for the Massey Station Mining Co., of Massey Station, Canada, and on Thursday of last week made an official test on the roads near the company's plant. The spectators included a number of engineers, scientific men, newspaper people and the officials of the company.

The tests proved satisfactory to the officers, and no difficulty was experienced except where ice was encountered, which interfered to some extent with traction on account of the small tires fitted to the train.

The train consisted of a traction engine, or tractor, as it is termed, and several cars resembling wagons. The tractor is equipped with a three-cylinder four-cycle engine of 7 by 10-inch cylinders and developing 40 horsepower at 400 revolutions, which operates a generator that supplies electricity for a motor on each car and the tractor as well. The cars are connected by means of an ordinary draw-bar, and the wires are connected by means of a plug switch.

The system is something similar to the Sprague, used on elevated roads in some parts of the country. The tractor itself weighs 6 tons, has 6-foot wheel base and 6-foot track, the driving wheels being 36 inches and the steering wheels 32 inches in diameter. Both wheels are fitted with solid rubber tires, the former with 7-inch and the latter with 3½-inch. The cars are driven by a double chain, from a pinion on a countershaft. The cars weigh 2½ tons each, have a 10-foot wheel base and a 10-ton capacity.

After the test had been satisfactorily made the invited guests were given a banquet, at which the subject of heavy powered motors and power commercial vehicles was discussed by several of the officers of the company and the guests. The company reports that it has an order for a similar train from the Pacific Coast Borax Co.

#### MOYEA HAS NEW OWNER

The Consolidated Motor Co., of New York, has purchased the Moyea Automobile Co. and will make Moyea touring cars as well as motor boats and business vehicles. The president of the new company will be H. C. Cryder; vice-president, Lowell M. Palmer, Jr.; secretary, Henry U. Palmer. W. H. Owen will be general sales manager.

## UNLIKE DOURDAN ROAD

### Mississippi Valley Tourists Find Roads in Southern and Central Illinois Almost Impassable

A trip from Chicago to St. Louis was made last fall by Mr. and Mrs. G. M. Davidson, of Chicago, in a St. Louis car, and while not filled with hairbreadth escapes or many accidents, it was a pleasurable tour.

It was the original intention of Mr. and Mrs. Davidson to visit their old home in central Ohio, and the start was accordingly toward Indianapolis, Ind. Leaving Chicago at noon, the run to Beecher, Ill., was made by 4 o'clock, where they stopped for the night. The roads after leaving the city were good dirt roads, except at a few places where they had recently been worked and were covered with loose dirt and sod. The low gear of the machine, however, carried them safely over the rough places.

From Beecher good progress was made until the party reached the Kankakee river at Mokena. Here trouble commenced. The road suddenly changed from solid dirt to loose, fine sand, which did not contain enough clay to make it pack. After ploughing through this for several miles the tourists stopped at a farm house to inquire whether there was any prospect of getting a less sandy road leading toward Indianapolis. The result of the inquiry was not very encouraging, as the farmer told about several hills on the road that were covered with about 10 inches of loose sand. He also told of the troubles of other automobiles that had passed over the road during the summer. Two had broken down and were shipped home by train. One operator, when he found so much sand, had hired a team of horses to assist him, rather than strain his machine endeavoring to make it carry him through by its own power.

Despite the gloomy predictions of the agriculturist, the decision was made to push ahead. Putting on the low gear, the tourists moved slowly along through the sand for several miles and were congratulating themselves that they were moving at all, when suddenly on a short sand hill, something in the gear case let go and the car stopped. An examination showed that a steel pinion of the transmission gear had broken. Inquiring at the nearest farm house, it was found that about 2 miles away, at a French settlement called St. Anne, there was a blacksmith shop. The farmer and his mules were impressed into service to tow the machine to the shop. Here the broken gear was removed and Mr. Davidson went to St. Louis to the factory and secured a new one, returning the following night.

At St. Anne the tourists learned that the roads leading to the east and south had much loose sand on them, but the roads leading to the west were free from sand. Therefore they decided to change the route and go to St. Louis. Taking the road leading directly west for St. Anne, they went to Chebanse and from there followed the Illinois Central railroad south to Gilman, where they stopped for the night. Upon inquiry, they found that the best roads led west from Gilman 40 miles to Chenoa, and directly on the route generally taken by automobilists traveling from Chicago to St. Louis. The next morning the start on this road was made, Chenoa being reached at noon. After lunch they started southwest toward Bloomington and were making good progress

over a rutty road, when they had the first and only tire failure of the entire trip. This caused a delay of an hour, as it was necessary to put two patches on the outer casing, and Bloomington was not reached until after dark.

The following morning the machine was thoroughly cleaned, a new tire put on, and the start made toward Lincoln. The roads were rough and badly cut and the sun was under a cloud all the afternoon, so that by 4 o'clock it was nearly dark. It was still 10 miles to Lincoln, and being near a little farming community called Lawndale they decided to stop. At the combination post office and general store the postmaster and proprietor was asked if there was a hotel in the town. He said there was no hotel, but that in addition to his other duties he sometimes took in travelers who were obliged to stay in town over night. His hospitality was accepted and the accommodations found to be excellent. There being no stable or shed in which to house the car, the postmaster made a deal with the engineer of an elevator whereby the car was run on an incline into the second story of the elevator for the night.

The next day the road followed section lines so that the course was continually changing from south to west and from west to south. Early in the afternoon Springfield was reached and the travelers decided to stay there over night. During the night it rained hard, but a new start was made the following morning. As soon as they got off the paved streets into the country the tourists found that the rains had softened the black dirt into a sticky, slippery mass, locally known as gumbo. It was almost impossible to keep the vehicle in the road, as the rear wheels skidded as much as they would have done in grease. After proceeding a short distance through this gumbo it was decided to abandon the trip for the day, so the return was made to Springfield to wait for the gumbo to dry.

The following morning the condition of the road was much improved and the journey to the coal mining town of Staunton was made by 3 o'clock. Here the party was told the roads to St. Louis were excellent, and that the last 10 miles from Collinsville to East St. Louis was a rock road, being part of the old National road from St. Louis to Washington. The road was good as far as Edwardsville, and fair from there to Collinsville. From Collinsville to East St. Louis, however, the tourists found the poorest 10 miles of road they passed over during the entire trip. Instead of rock, it was mud and deep holes every few feet, so that progress was very slow.

The Eads bridge was reached at noon and a few minutes later the final stop of the journey was made at the hotel. The car was in good condition and was now "back to the city of its birth," having traveled over 6,000 miles since the opening of the season.

#### FOR CLUTCHES THAT SLIP

A slipping clutch is a source of constant annoyance to the driver, as much of the power developed by the engine is wasted by the clutch slipping instead of its transmitting the power to the road wheels for purposes of propulsion. It will usually be found that the cause of abnormal slipping lies in the fact that the clutch is in such a position as to take up a lot of the oil which is ejected from the crank chamber of the engine or the gear case. If such is the case, the first thing is to find the course pursued by the oil, and to check it by means of a baffle plate composed of a piece of tin,

# THE BRITISH EDITOR'S POINT OF VIEW

## AUTOMOBILING AND GOOD ROADS

Since the coming of the automobile and the pneumatic-tired bicycle great strides have been taken in improvements as regards road construction and maintenance, though few would hazard an opinion that such improvements are anything but partial in the extreme. Indeed, the invention of the rubber tire gave birth to the necessity for a revolution in road construction and an attempt to make some progress towards perfection of surface. It is not merely in this direction, however, that the automobile is calculated to forward the work of reform on our highways by bringing home to the minds of the community the urgent necessity that exists for it. The report of the departmental committee on highways clearly shows—indeed the report itself states—that the increase of motor car traffic brings about an entirely new set of conditions as regards the manner in which the country's roads must in future be administered and developed.

It is as yet, of course, too early to say to what extent the country's long-distance traffic will return to the roads in consequence of the advantages offered by the motor car, but it can safely be asserted that the increase in the number of self-propelled vehicles covering long distances at a high rate of speed is sure to be very large—much larger, indeed, than is possible at present to guess. Not only passenger cars for pleasure use will throng the roads, but heavier motor wagons for transport purposes of all kinds are in the course of time practically certain to supersede the slow-going horsed vehicles of to-day. It is the necessity for coping with that state of things that makes the reorganization of the national system of road control and administrative development essential. Already it is becoming a matter of the closest personal concern to a very large proportion of the people of this country that the roads, other than those in their immediate vicinity, should be properly built, properly controlled, and such methods of repair adopted as shall insure their being kept at the highest pitch of efficiency. As the motor car is adapted to a wider and ever-widening extent, the need for proper roads will become more and more urgent, and the question of their provision will have an influence of the utmost importance in forwarding or retarding the commercial development of the nation. At present our highways are altogether inadequate, while the fact that control of them is so sectionized, subdivided and split up, makes improvement practically impossible. What is wanted is that our system of highway communication shall be planned, controlled, and developed on scientific lines, so that roads can be made fit to cope with increased facilities for high-speed locomotion. The report of the departmental committee is only one step in this direction, and even if all its recommendations were acted upon by the legislature, reform would still be far from complete. It is, however, a step forward, and the subject can never be allowed to drop back into the position of obscurity it has so long occupied. There is now an opportunity to obtain at least a partial recompense for the efforts that have been put forth, but it will require activity and vigilance, in agitating for legislation on the lines of the report, to obtain it, and to secure for

the advancement of our national prosperity all the benefits which a modern system of international communications would enable us to reap from automobilism in all its forms.—Automobile Club Journal.

## THE PUBLIC AND SPEED TRIALS

No one who witnessed the motor speed trials at Southport, excellent and interesting as they were, can deny that before this meeting is again promoted some thought will have to be taken as to the means by which the various courses among the cars of different classes can be made more spectacularly attractive to the public who come to look on and to be entertained by something in the shape of visible contests. It cannot be denied that the large majority of the heats in all the events except those including the racing cars were more or less of a processional nature. True, the automobiles were competing against each other on the watch, but as the times made by the winning car did not go up on the few boards there were available until some little time after the heats had closed, the public were far from being kept in close touch with what was going on. It needed continual reference to the programme, too, to discover which event was in course of competition. We think it will be agreed that the scheme of price classification which was adopted and served well enough for the 1,000 miles reliability trials is not at all successful when applied in connection with such speed trials as were carried out at Southport. If the public are to be interested and drawn in their thousands year by year to witness these trials, the public must be afforded some visual entertainment, something in the character of close finishes. That a close finish does excite the keenest regard was evidenced clearly enough at the moment when Jarrott, by supreme judgment, passed Iden on the post, and when Edge and Hutton flew side by side at terrific speed over the finishing mark of the kilometer. The roar of voices which accompanied the cars on their progress up the course, and which lasted for some minutes after they had passed from view, showed clearly how keenly the spectators appreciated something in the shape of a race. Mere speed, though exciting enough in itself, is not sufficient, for speed by itself must nowadays be something abnormal to attract remark. On the Southport course anything under 50 miles per hour looked like crawling, and as the rate of progress of many of the competing cars fell very much below this there were times when things fell very flat indeed. How to avoid this apparent lack of competition remains for those who are most closely connected with the promotion of the Southport speed trials in 1904. There are about them the makings of a great annual meeting which will attract spectators from far and near, but there must be visible competition, and that evidently cannot be provided by such classification of vehicles as obtained last week. Also, those organizing next year's trials will have to devise some fuller and readier means of keeping the watching public acquainted with results, the three hand painted boards in use at Southport being totally inadequate for the purposes. The spectator is not satisfied with what he sees; he wishes to know all about it and should be told.—The Autocar.

## TOURING CAR DEVELOPMENT

Progress is rapid in the automobile world—how rapid only those who are closely in touch with motor manufacturing know. That fact, and the high state of development to which the tourist motor car has attained, are strongly impressed on one by certain new features which have been introduced into the system of making in this year's reliability trials. If anyone had proposed 4 years, or even 2 years ago to penalize competing cars in the trials of vibration, noisiness, dust-raising and the like, he would simply have been laughed to scorn; yet all these factors will have a very important bearing upon the results of this year's tests, while, in addition, finish and appearance and general cleanliness of the motor and gear are also to be largely taken into account. The reason for introducing what may, perhaps, be called minor considerations such as these is not far to seek, nor is the fact that it is not only possible, but absolutely essential, to allow for them difficult to understand. It amounts to this, that the modern motor car has reached a standard of perfection so advanced that in order to differentiate between cars, all of a very high level of excellence, questions of convenience, comfort, and appearance have to be decided upon with the greatest nicety.

Your modern automobilist is the most exacting person in the world where his car is concerned, and he is by no means satisfied unless to good speed qualities, the efficiency and general reliability of mechanism, are added all the qualities which the owner of a smart horse carriage considers essential—style, appearance, and comfort. Manufacturers have already realized this, and during the past two years competition has been very keen among them to produce not only a thoroughly trustworthy car so far as running qualities are concerned, but also a handsome, comfortable, cleanly and well-finished vehicle. It is evidence of a new stage in the progress of automobile construction, and be it said, a department of it which is in some respects quite as important as the primary considerations of engine efficiency and power, strength and rigidity of frame building and all-round reliability. Motor cars must express a certain degree of refinement and elegance as well as the predetermined degree of power.

It does not, however, indicate that the automobile, whether as a pleasure or a commercial vehicle, has attained anything like the fulness of its growth. Far otherwise, indeed; it shows merely that there is a general recognition that all branches of its development must now go hand in hand. The touring motor car of to-day is a conveyance so luxurious that to some it might perhaps seem that little can be done to improve it, but it may safely be asserted that its fellow of, say, a decade hence will be ten times more comfortable and commodious. Indeed, the development of the automobile for touring purposes has far exceeded the most optimistic anticipations of those who nursed English automobilism in its early days. What its future progress will be it would be impossible to say, but to judge from the advance made during the past 7 years it will be as great as it will be beneficial in altering English commercial and social life in all its aspects.—Automobile Club Journal.



# MOTOR BOATING

## NEW NAPIER RACER

The new Napier racing motor boat, which is entered for the Monaco races, is fitted with a four-cylinder 45-horsepower gasoline motor, similar to those used in the motor cars of the same make. The racer will be 42 feet long and of 5½ feet beam. One of the features of the racer is that the man who handles the steering wheel is seated behind the motor, which is located at the front end of the pit and thus he has full control of the starting, speed and reversing of the boat. The fuel is kept in a specially built tank, intended to be danger-proof. The exhaust pipe leads to a muffler located in the rear of the boat. Both the stem and the stern of the boat are very narrow; much more so, in fact, than of other racers of the same general dimensions and power.

## ORGANIZE A LAUNCH CLUB

New York, Jan. 18—The organization of a launch section has, for several months past, been in contemplation by the Long Island Automobile Club. The agitation among the club members resulted in a final and decisive action. At a meeting of the officers and board of governors, President F. G. Webb named the following committee to take suitable steps toward a definite plan of action and enrollment: Chairman L. R. Adams, J. Adolph Mollenhauer, commodore of the Pentaquit Corinthian Yacht Club of Bay Shore, and C. H. Tangeman. From the numerous expressions of approval from launch-owning members, the future of the launch section seems an assured success. H. L. Towle, the chairman of the technical committee of the club, is to act in advisory capacity to the committee.

Through co-operation with the Tavern Club of Brooklyn, which owns a commodious houseboat, it is expected to maintain a permanent summer rendezvous in Hempstead harbor, as the Tavern Club contemplates anchoring off Glenwood, about a mile south of the Sea Cliff Yacht Club house. A number of the members of the Tavern Club are actively interested in the automobile club. This probably is the first of a number of affiliations which later will be formed.

## THE THOMAS "FLYER"

Before E. R. Thomas entered the automobile trade he was in the bicycle trade, and before he was in the bicycle trade he was in the boat business. He has now gone back to first principles, by adding to the business of the E. R. Thomas Motor Co., of Buffalo, N. Y., the manufacture of light, fast power boats, so-called automobile boats for want of a more expressive term.

The company is constructing several boats which are not freakish, but which are intended for roomy speed launches, a cross between the strictly racing boat of no other utility, and the slowly laboring ordinary motor launch of pleasure usefulness. The boat is fast, being designed to go 17 or 18 miles an hour, but in the drawing of the lines seaworthiness has not been sacrificed.

The boat has a needle point bow and a very wide stern, the widest section of water line being at the stern. The whole boat, however, is wider on the water line than on the deck. The hull is strong, with frames running from deck to deck, and with two bilge clamps running the full length of the boat. Three-inch

tumbled home stems add to the appearance of the water line. The propeller wheel is 26 inches in diameter, of three blades and reversible. The rudder swings on a pivot and is operated by either of both side and front steering wheels. The steering cables are fitted with turn buckles for taking up slack. Forward there are six roomy lockers, while there are two more in the rear.

The boat is 30 feet long on the water line and of 5 feet beam. The freeboard is 25½ inches, the draft 7¾ inches and the weight of the complete boat is about 1,200 pounds. The displacement is about 1,400 pounds and the seating capacity fourteen to eighteen. The power plant comprises a regular Thomas "Flyer" automobile engine, of three cylinders and developing 24 horsepower. This motor was described recently in MOTOR AGE in connection with a description of the Thomas car.

## MATCH RACE CONDITIONS

In the match race for automobile boats arranged by Hollander & Tangeman and Smith & Mabley for a cup valued at \$2,000, the conditions have been agreed upon as follows:

Over all length of boats to be not over 45 feet and not under 30 feet. Each boat must contain at least two persons when racing. Boats may be raced with or without mufflers.

The \$2,000 trophy shall be won by the boat winning two races out of three. The course shall be triangular and 30 miles in length. The date of the race shall be between May 1 and June 1, the exact date to be settled before April 15.

Both boats must be equipped with reversing gear and two life preservers. Each boat must contain in its tank at least 25 gallons of gasoline on crossing the starting line.

The match to be held in conformity with rules regarding time allowance, to be mutually agreed upon by both sides, and this with the intention and desire of testing said rules as regards their fitness for future contests for the trophy.

## A FAST BRITISHER

The Durendal is an English gasoline racing boat that figured prominently in races last season. It was designed by Wort & Beadle, of Cowes, England, and was built, for Frank E. Beadle, especially to compete in the Harmsworth cup race.

The boat is 30 feet long, of 5 feet 10-inch beam, depth 2 feet 4 inches; draft, including propeller, 22 inches, and is equipped with a 50-horsepower motor; yet it weighs complete less than 2,000 pounds. It is said that in trial spins the boat has developed 19 and 19½ knots an hour. The hull is of veneer construction, being made of three layers of mahogany, secured with copper wire, and without frame timbers of any kind. The motor is composed of two four-cylinder M. M. C. motors, placed in line longitudinally of the boat and with their respective shafts coupled by a universal joint. It is set 12 feet from the stem. The crank casings, which are of aluminum, are supported by side arms after the fashion of an upright automobile motor mounting.

In the ignition system a single trembler is used in connection with eight coils, a low tension commutator connecting it consecutively with each of the eight cylinders. There is a reserve trembler on the coal box, which may be switched in at will to alternate with the other. There is no muffler, the exhaust pipe being led alongside the boat to the stern. While there is more noise than would be desirable in the case of a strictly pleasure launch, the rapidity of the impulses of the eight cylinders prevents an excessively disagreeable exhaust. The propeller shaft projects about 5 feet into the water at the rear, and carries two propellers, the forward of which is 14, and the rear of which is 18 inches in diameter. There are two blades on each propeller, set at 90 degrees to each other. There is no reversing gear; but the rudder is at the very rear of the boat and is quite small, and allows the turning of the boat within a short space.

This boat, slightly changed, will be entered in next summer's races in English and continental waters.

## POWER BOAT NOTES

The French use the word *autonautique* for motor boat racing.

Marine motor builders have adopted the automobile idea of casting the cylinder and head in one piece, instead of making the latter detachable.

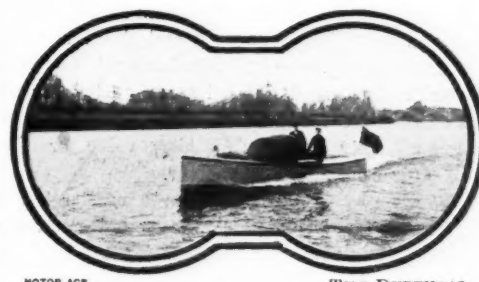
A launch that a few years ago made Chicago its port was recently confiscated by government officers at New Orleans on the ground that it was engaged in contraband work.

A number of steam yacht races have been scheduled for the coming summer in and about New York bay. Kanawha will defend the title to the Lysistrato cup against F. M. Smith's Haouli. Mr. Smith has offered two cups and the Telford cup will also be sought from Norman.

The ordinary launch light will not suffice for the Mississippi and Ohio rivers. The requirements are for a red port light and green starboard light which can be seen from both astern and when approaching head on. Ordinary colored lanterns are usually hung amidship.

## FRENCH EXPORTS

During the first ten months of 1903 the French export trade amounted to \$8,769,800, as against \$5,310,200 for the corresponding period in 1902 and \$2,682,800 in 1901. The importation of automobiles during 10 months shows a value of \$191,800 for last year, \$156,000 for 1902 and \$103,200 for 1901. The motor cycle trade shows a decided decline, the export during 10 months of 1903 amounting to \$82,800, as against \$99,800 during the corresponding period in 1902. The importation of these machines also increased in value for 10 months being \$2,800 in 1903 and only \$1,800 in 1902.



MOTOR AGE

THE DURENDAL

## THE READERS' CLEARING HOUSE

### COMPRESSION SPACE

Hartford, Conn.—Editor MOTOR AGE—What is the average width of the water jacket space of an automobile motor? Is there any rule governing this space?

How is the compression space of a motor determined? Is it dependent upon the bore and stroke of the motor, or is there a fixed rule? Does the size of the compression space vary in different engines of the same power?

Is a mechanical inlet valve better than an automatic inlet valve, and if so, why? How far does the piston descend on the admission stroke, before the automatic valve opens? Does the valve close immediately at the end of the stroke, or after the piston has started upward on the compression stroke?

Which will give the greatest speed in the case of a motor cycle motor, a carburetor or a vaporizer? Which will give the best service in all-around use, including touring and racing?

Is turning the exhaust into the frame tube good practice, or should a muffler be used? Does an exhaust pipe of many turns cut down the engine power?—J. J. O'CONNOR.

The average water jacket spaces are from  $\frac{1}{2}$  to  $\frac{3}{4}$ -inch wide. There is no specific rule governing this space. Enough water must be circulated around the cylinder to keep it sufficiently cool, and at the same time it is not desirable to make the whole cylinder casting unnecessarily large and bulky. Some designers use the rule of making the water jacket width one-tenth the diameter of the cylinder; other designers make a more liberal allowance.

The determination of the compression space mathematically implies the use of complicated formulas.

Letting C equal the compression space in terms of the cylinder length; E equal the stroke; D equal C—S; and P the pressure of compression; one formula is: D equals S divided by  $1-(7.507 \text{ divided by the square root of } P \text{ times the square root of } P)$ . C would, of course, then be found by subtracting S from D. By using 80 pounds as the pressure of compression, this formula would reduce to,  $D=S$ , divided by .7193. Roughly, then, the compression space would be from 30 to 40 per cent of the stroke. The compression space in all motors of the same horsepower is not the same.

There is a division of opinion in the matter of the mechanically and atmospherically operated inlet valve. The former insures a quick positive action, but adds complication, and is not as sensitive in adapting its action to various speeds, especially to high speeds. This question was discussed at greater length in MOTOR AGE several months ago. The time of opening and closing of the atmospheric inlet valve depends entirely upon the tension of the spring and the engine speed. In ordinary practice the valve lags slightly behind the end of the piston strokes in opening and closing.

Most motor cycle builders have adopted the popular form of float feed spray carburetor as more suitable for general use than either the Lunkenheimer style of mixing valve or the old style of surface carburetor.

The use of a frame tube for a muffler is all right as far as muffling the sound goes, so long as it is arranged to possess the necessary qualities of a separate muffler. The principal

disadvantage is the weakening effect upon the frame of subjecting one of its members to constant heat.

If turns in the exhaust pipe are sharp they will create a certain amount of back pressure. If they are gradual they will have no perceptible effect upon the efficiency of the motor.

### TWO-CYCLE MOTOR POINTS

Niles, Mich.—Editor MOTOR AGE—I am contemplating building a two-cycle motor of 4-inch bore and  $6\frac{1}{2}$ -inch stroke. The exhaust port will be at the bottom of the stroke, and will be  $1\frac{1}{2}$  inches in diameter. The piston will, accordingly, receive the benefit of the impulse for 5 inches of its stroke, before the beginning of the uncovering of the exhaust port. The crank case will be large. The inlet pipe and valve will be  $1\frac{1}{2}$  inches in diameter. The explosive mixture will be admitted to the cylinder at the top, which will avoid the use of a baffle plate or deflector.

It has been my experience with two-cycle launch motors that the mixture is fired at a low compression. In one instance I found that the compression space between the piston and cylinder head was equal to the stroke of the engine piston. Is an engine so constructed more economical in fuel consumption than one with a smaller compression space? If a two-cycle motor runs more economically with the large compression space, would it not be a good plan to attach a small pump to the crank case and connected with the carburetor to assist in supplying the crank case with the fuel from the carburetor? On the upward stroke of the piston both the crank case and the pump would receive a charge and on the admission stroke a full charge of fuel would be taken into the cylinder. What should be the pressure in such a motor, and what would be the space between the piston and the cylinder head? Running at 900 revolutions per minute, what would be the horsepower?—J. DuLUC.

It is not clear from the letter just how the pump is meant to operate. Two-cycle motors have been built, in which there are two cylinders, one used as an impulse cylinder and the other as a compression cylinder. It is ordinarily claimed that a two-cycle motor can not have over 30 or 40 pounds compression pressure, but advocates of this type of motor say that the compression may be carried just as far as in a four-cycle engine. The clearance space in the 4 by  $6\frac{1}{2}$ -inch two-cycle motor would be about 2 inches. At 900 revolutions per minute a two-cycle motor of this size would develop about 7 horsepower.

### DRIVING SPEED RATIOS

Canton, Ill.—Editor MOTOR AGE—I have a steam runabout running gear and body and wish to equip it with a Friedman double opposed, horizontal motor, which is rated at 6-horsepower at 1,000 revolutions per minute. The differential on the rear axle of the running gear has a forty-tooth sprocket and is in the center of the axle. What number of teeth should there be on the transmission gear sprocket to give a running speed of 30 miles an hour on the direct drive? The transmission gear will be on a counter-shaft, as the running gear frame is not wide enough to

permit placing the gear in line with a cross motor shaft, and still keep its driving sprocket in line with the sprocket on the differential gear. How should the motor be mounted? If the rear sprocket were of thirty teeth, how many teeth should the front one have to attain the same speed as in the previous case?—F. W. MATTHIESEN.

Presuming the wheels to be 30 inches in diameter and the speed of the counter shaft the same as that of the motor on the high speed or direct drive, a fifteen-tooth driving sprocket would give a running speed of 30 miles an hour in connection with a forty-tooth rear sprocket, and a motor speed of 900 revolutions. With a thirty-tooth rear sprocket an eleven-tooth front sprocket would give the same result. Probably the most convenient method of mounting the motor would be to place it in front under a bonnet and drive back to the transmission gear with a chain, the transmission gear being so disposed on its counter shaft that its final drive sprocket would line with the differential sprocket.

### CALCIUM CHLORIDE IN VALVES

Cleveland, O.—During the first cold spell the water jackets on the cylinder heads of the motor of my automobile were cracked. The motor is of the double opposed cylinder pattern with the heads cast integrally with the cylinders. The cracks were cemented, but soon after the beginning of the use of calcium chloride as an anti-freezing solution, water was noticed to escape into the combustion chamber. The motor ran well enough for a few days, but soon became so weak that it would not run when the car was on the high speed gear, being able to pull the load only when the low gear was used. I removed the valves and found both inlets encrusted with calcium chloride. The leak into the combustion chamber is minute, creating nothing more than a mere dampness, but the calcium deposits so heavily on the valves that they do not seat properly, and hence the compression is extremely low. Can you suggest a remedy?—E. RIEMENSCHNEIDER.

If it is desired to continue the use of an anti-freezing mixture, use a solution of 20 or 25 per cent glycerine in water, instead of the calcium chloride solution.

### WERE THEY BROKEN

Hartford, Conn.—Editor MOTOR AGE—Recently I experienced a queer accident with a motor cycle. I started from here for New Britain with the machine in good order and running splendidly, and made the 10 miles in good shape, including the climbing of a 25 per cent grade without trouble. In fact I do not believe the motor missed an impulse during the whole of the fast running trip. On the return trip, however, when the motor was running well, it suddenly stopped. As soon as the machine slowed down I jumped off and examined the motor. There was absolutely no compression. I started to roll the machine off the road that I might examine the valves; when the rear wheel suddenly struck, and I found, to my surprise, that the compression was again all right. I started on and managed to get home with the assistance of a little pedaling, for while the machine would run all right on the level it would not take even the slightest grades. Also, when riding fast, the motor would suddenly stop, and then again pick up and go on. After I reached home the machine would not run at all. The next day the cylinder and head were taken off and



three piston rings were found to be broken, all in the same place. The points of broken pieces were blued, as though they had been very hot. How could these rings have been broken? Do the piston rings turn in the grooves when the engine is running?—J. J. O'CONNOR.

It is possible that the correspondent mistakes the usual joint in the piston ring for a break, the fact of the breaks all being in the same place suggesting this. In such event the loss of compression would be simply due to the fact that the rings work around in their grooves until all the slits are in line, forming a gas passage. The rings should be turned around and if they refuse to stay in proper position may be pinned.

#### MOTOR OVERHEATING

Waynesburg, Pa.—Editor MOTOR AGE—I have a gasoline car with a 4-horsepower motor. The motor overheats rapidly and the water evaporates quickly. The circulation seems good, as the water runs freely from the pump and radiator when the valves are open. Other cars of the same make are in use here, and they use up but very little water. How can this overheating be obviated?—G. E. H.

If the circulation is all right and other cars of duplicate construction are efficiently cooled it would be almost impossible to point out the difficulty without further information. It is possible that mineral matter has been thickly deposited upon the hot surfaces inside the water jacket and thereby has formed a cake which is a non-heat-conducting surface. Occasionally over-heating results from the use of a too rich mixture in the cylinder. Poor lubrication also tends toward over-heating.

#### INCREASING MOTOR POWER

East Liverpool, O.—Editor MOTOR AGE—I have a  $3\frac{1}{2}$ -horsepower motor on a runabout. It does not develop quite enough power to be satisfactory. The bore is  $3\frac{3}{8}$  inches and the stroke  $3\frac{3}{8}$  inches. The cylinder wall is 3-16-inch thick and will consequently not stand much boring. Would it be practicable to put in a longer shaft, extending enough beyond the crank case to permit of the attachment of an outside fly wheel in place of the inside fly wheels now used? If so, how much additional power would be obtained?—W. R.

It would not be worth while to change the fly wheel. Perhaps the motor will stand a higher compression. This may be obtained by screwing a plate of aluminum, say  $\frac{1}{8}$ -inch thick, and slightly less in diameter than the piston, to the top of the piston.

#### SELECTION OF MOTOR

Boston, Mass.—Editor MOTOR AGE—Which tends toward the most comfort in riding, a single or a double-cylinder motor? Should the motor be horizontal or vertical? On a double cylinder motor what should be the relation of the cranks and impulse strokes to each other? What should be the bore and stroke in each case, with a presumed piston speed of 600 feet per minute, to give a carriage speed of 18 to 20 miles an hour, carrying four passengers?—O. W. C.

There is no fixity of opinion in the question of number and kind of cylinders. Popular taste seems to be in favor of the two-cylinder motor. Each form has advantages and disadvantages. It is a matter of selection of good and weak points. The common arrangement of a double-cylinder vertical motor is with the cranks at 180 degrees and with the impulses following each other, that is, first at

one-half revolution and then at one and one-half revolution apart. A four passenger light car should have a motor of about 8 horsepower at least, which at a piston speed of 600 revolutions per minute would be of  $3\frac{3}{4}$ -inch bore and  $4\frac{1}{2}$ -inch stroke if of two cylinders and run at 800 revolutions per minute.

#### MIXING VALVES

Kewaunee, Wis.—Editor MOTOR AGE—Will you please furnish me with the addresses of parties making generator valves and carburetors for use on two-cycle marine engines, the mixer having a valve to sustain the back pressure of the compression within the motor crank case. I do not wish to follow the usual custom of placing a valve between the carburetor and the motor, as I wish to place the carburetor very close to the inlet port on the crank chamber.—F. J. DISHMAKER.

A mixing valve of the Lunkenheimer type and equipped with a check valve can probably be secured of some builder of marine engines.

#### MAINTENANCE COST

Rhinebeck, N. Y.—Editor MOTOR AGE—Concerning the cost of maintaining a first-class automobile my experience in handling a Mercedes belonging to Col. J. J. Astor may be of interest. The car was delivered in September, 1902, and has since then been continually under my care. It has run 8,000 miles. The total bill for duplicate parts and repairs has been \$23.25. Of this amount \$17 was for repairs after a slight accident. Tire replacements are not included, of course, in this bill of expense. I am now overhauling the car thoroughly, and think that an expense of about \$100 will make the chassis as good as new.—B. MORGAN.

#### ENCASED FLY WHEELS

Denver, Colo.—Editor MOTOR AGE—I am about to build a 4 by 4-inch bicycle motor with the fly wheels encased in the crank box. What is the smallest size and weight of fly wheel that can be used with satisfactory results. The motor will run at 900 revolutions per minute.—H. A. SATTERFIELD.

The fly wheels should not be less than 8 inches in diameter and should weigh at least 25 pounds.

#### TO "SPRING ON" A FRIEND

Lonsdale, R. I.—Editor MOTOR AGE.—For those of the readers of the Clearing House who are interested in such absorbing problems as "How old is Ann"? I suggest the following question: Two automobiles start simultaneously toward each other, one from New York and the other from Boston; the car from Boston travels at 20 miles an hour, while that from New York goes at 30 miles an hour. When they meet, which one is nearest New York?—G. W. PROWSE.

#### COMFORTABLE ROAD CARS

Santa Paula, Cal.—Editor MOTOR AGE—I have read much of French machines, but am of the opinion that, regardless of the supposed excellence of the foreign cars, American builders should break away from French design and build cars essentially American, and especially intended for rough use on American roads. Particularly should cars have long wheel base, large wheels and a tonneau well forward of the rear axle. A short wheel base with the tonneau back of the rear axle is the height of folly for road use. I have been accruing experience in this line, and unless the 1904 vintage produces something especially to

my liking, intend to have a touring car made to order. It will have a wheel base of at least 10 feet.—L. B. HOGUE.

#### AXLE DIAMETERS

Chicago—Editor MOTOR AGE—What size should be the axles of a car weighing between 2,000 and 2,200 pounds, and intended to carry five persons? Is a  $1\frac{1}{2}$ -inch rear and a  $1\frac{3}{8}$ -inch front axle heavy enough to safely carry the load?—H. M. E.

The axles specified would serve, but the safer plan would be to use  $1\frac{3}{4}$ -inch rear and  $1\frac{1}{2}$ -inch front axles. The size of the front axle depends somewhat upon the disposition of the motor.

#### POWER OF MOTOR

Wilkesbarre, Pa.—Editor MOTOR AGE—I am building four three-cylinder gasoline motors of 3-inch bore and stroke, to run about 1,500 revolutions per minute. What should be the size of the compression space and what horsepower will one of these motors develop?—John H. Fullmer.

The compression space in terms of cylinder length would be 1 inch. The three-cylinder motor will develop about 8 horsepower.

#### CYLINDER WALL

Green, Ia.—Editor MOTOR AGE—Of what thickness should the walls of an air-cooled motor of  $3\frac{3}{8}$ -inch bore and 4-inch stroke be?—C. E. S.

The thickness of such a wall is controlled principally by the restriction of casting. It should be about 3-16 of an inch thick.

#### RELATIVE FLY WHEEL WEIGHTS

Grove City, O.—Editor MOTOR AGE—In the case of four and two-cycle motors of the same bore, stroke, speed and compression, what would be the relative weights of the respective fly wheels?—S. R. Allen.

The fly wheel for the four-cycle motor would be twice as heavy as that of the two-cycle motor.

#### WEIGHT OF FLY WHEEL

Hebron, Neb.—Editor MOTOR AGE—What diameter and rim weight of fly wheel should be used with a motor of 6-inch bore and 8-inch stroke, running about 500 revolutions per minute? What should be the sizes of the inlet and exhaust valves.—W. Beisner.

The fly wheel should be 22 inches in diameter and with a rim weight of about 350 pounds.

#### CHEAPER THAN WALKING

The trip of the York party from Minneapolis to Portland, Me., in a Packard is now an old story, but the record of its expenditures and broken parts is of some interest even now. As compiled by Jack Elliott, the chauffeur who drove the car on the long journey, the total expense bill for repairs on the trip reached the enormous sum of \$2.10.

This remarkable total was obtained as follows: One broken spring, welding, 95 cents; two new leaves, \$1; one bolt, 5 cents; cutting thread for new screw on vibrator, 10 cents.

The engine consumed during the entire trip 163 gallons of gasoline, which varied in price from 18 cents to 35 cents, reaching the latter figure in Canada. Mr. Elliott used cylinder oil with a prodigal hand, and to this fact he attributes to a large extent the uneventful journey. In all 17 gallons of cylinder oil and 10 pounds of hard oil were used.

## FROM THE 4 WINDS



MOTOR AGE

THE GRAY WOLF, ITS CREW AND ADMIRERS ON THE FLORIDA BEACH

The council of Springfield, Ill., has passed an ordinance decreasing the automobile license from \$5 to \$2 a year.

The Russell Motor Vehicle Co. has purchased the plant of the Saeltzer Woolen Mills Co. at Cleveland, O., and will manufacture a line of automobiles.

The ten members of the Brattleboro, Vt., Automobile Club entertained the Vermont Automobile Club with a banquet and smoke talk last Monday evening.

The stands of the Mors, Mercedes and Charon, Girardot & Voigt companies were awarded the gold medals at the Paris salon for the elegance of display.

The Albion Engine & Motor Co., of Albion, Mich., has been absorbed by the Jackson Engine & Motor Co., and the men and machinery will be transferred to Jackson.

The French provincial automobile clubs have formed a federation, which will be represented and have a voice in all the committee meetings of the Automobile Club of France.

An anonymous writer in a German daily urges the German government to increase the tax on automobiles to \$75, regardless of the horsepower, the price of the car or any other consideration.

In anticipation of a large, complete catalogue which will be issued in February, Charles E. Miller, 97 Reade street, New York, has sent out a small special catalogue showing some of his leading specialties.

The Peoria Automobile Co. has been incorporated at Peoria, Ill., and about March 1 will open a salesroom and garage on Hamilton boulevard. C. L. Turner has been appointed superintendent of the company.

The British manufacturers and the Automobile Club of Great Britain have again communicated with the Belgium Automobile Club with view to running the British trial race over the circuit des Ardennes course.

An automobile club was organized at Circleville, O., this month with the following officers: President, Dr. D. V. Courtwright; vice-president, H. W. Crites; secretary, Dr. George Heffner, and treasurer, C. L. Boyer.

The automobile tourists who have traveled to out-of-the-way and hitherto unknown spots in the past 3 years have demonstrated that the automobile is practicable for use anywhere that a horse and wagon can go with safety.

A postal service by automobile was formally inaugurated the first of January between Rome, Morlupo and Rignano, Italy. Besides carrying the mails, the service will be arranged to accommodate ten passengers on each run.

At a recent meeting of the Motor Cycle Club of France it was decided that at every meeting a few minutes would be spent in technical demonstrations of the construction and operation of the various parts of motor cycles.

The St. Louis, Mo., Motorcycle Club has requested that a bill be introduced in the council of that city providing for the payment of a license of \$2 a year upon motor cycles, motor tricycles, velocipedes and motor bicycles of all kinds.

The German automobile trade, in general, seems to be prosperous. A number of companies have declared dividends varying from 6 to 20 per cent. The Continental-Caoutchouc & Guttapercha Co. heads the list with a dividend of 50 per cent.

Auto-Life is the title of a new monthly automobile publication just started in Philadelphia, with A. H. Chadbourne as editor. The paper will endeavor to cover the automobile field in Pennsylvania, Delaware, Maryland, Washington, D. C., and southern New Jersey.

The meaning of the word reliability given by the London, England, Times, is that "in automobile it denotes, roughly speaking, the staying power of a motor car when it is subjected to usage it would never receive at the hands of its owner in any ordinary circumstances."

The Austrian war ministry has sent a letter to the Austrian Automobile Club stating it is in need of officers and men to perform staff and messenger duty in the army. These men must have motor cars or motor cycles, and will be given generous remuneration and expenses.

The third annual show given by the Automobile Club of Philadelphia and the Automobile Dealers' Association of Philadelphia, will be held in the Second Regiment Armory in that

city, January 25 to 30. The show will be under the management of H. Walter Schlichter and H. D. Le Cato.

The new British motor car law demands rigid investigation to discover whether the car is painted a certain color, and other questions of like vital import to the safety of the public, but it entirely neglects to inquire if the driver is blind, or has any legs or arms to properly handle the car.

The Montreal & South Shore Auto Car Co., of Montreal, Canada, will begin an automobile service between Victoria Square and St. Lambert the first of March. The automobiles will each carry twenty-two passengers and will be of 20 horsepower. The officers of the company are: S. T. Willett, president; Peter Lyall, vice-president.

In the 1903 reliability trials in England there were fifty-five English cars entered and forty-eight foreign cars. Twenty-one English cars, or 38.18 per cent, and nineteen foreign cars, or 39.58 per cent, received more than 8,480 marks. Medals were awarded to nine English and nine foreign cars, or 16.36 per cent of the former, and 18.75 per cent of the latter.

The trial spins of one of the new Napier cars which is to be entered in the eliminating trials for the Gordon Bennett cup race proved so satisfactory that one of the English journals ventured to spring a new and original joke. It said that the speed was so great that it needed two men to describe the pace, one to say "Here she is," and the other "There she goes."

The tendency of the Americans to drop the word automobile and substitute motor in its stead has become so pronounced that even the English papers have noticed it and commented favorably on the change. It is also rumored that we are soon to begin using petrol in the place of gasoline, and take our cars up to the third floor repair shop on a "bloomin' lift, y' know."

The Automobile Club of Great Britain and Ireland had about 100 members in 1898. By the end of the following year the membership had grown to about 500; in 1900 there were a little over 700 members, and 400 were added to the list in 1901. The most remarkable increase occurred during the year 1902, when 1,082 new members were admitted. At the end of last year the club had 2,550 members.

The Brooklyn, N. Y., Automobile Co. at its annual stockholders' meeting at the New York office elected the following board of directors: J. Hunt Smith, John H. Vanderveer, L. R. Adams and L. A. Hopkins. L. A. Hopkins was elected president and treasurer and John H. Vanderveer vice-president. This company will have the exclusive eastern control of the Haynes-Apperson output, and may also take on some other line.

Horace B. Day and Robert H. Brodeaut, formerly of the Cadillac Co. of New York, have formed a copartnership under the name of Horace B. Day & Co., and will sell the Wolverine and Queen cars in Greater New York, Westchester county and Long Island. As soon as improvements now in progress are completed the company will be located at 60 West Forty-third street, New York. Temporary quarters are now established at 220 West Thirty-sixth street.



The main factory of the Mercedes company in Wurttemberg, Germany, employs about 1,000 hands and 120 officials. The branch factory at Marienfeld, a suburb of Berlin, employs about 800 men and officials, and the one in Vienna, about 400 men and officials. There is also a branch in England and one in Milan and repair shops at Puteaux, near Paris. The new works at Unterturkheim is situated on a tract of 25 acres.

\*\*\*

Among the many Frenchmen who have been decorated recently by the French government there are several who belong to the automobile trade. Charles F. Chapelle, vice-president of the French Automobile and Cycle Board of Trade, was made an officer of public instruction, while G. M. L. Bondis, manager of the Charron, Girardot & Voigt Co., P. Peugeot and P. A. Darraeq were named officers of the academy. M. Darraeq was also recently made a knight of the Legion of Honor.

\*\*\*

Several French trade papers suggest that the French Gordon Bennett eliminating trials be held over the circuit des Ardennes route, in Belgium, claiming that this course is in a certain degree similar to the Homburg course, on account of its several difficult sections, its hilly nature and its turns. The opinion among makers is also somewhat in favor of the Ardennes course. They say it would be a mistake to hold the trial races over a good course which does not offer the difficulties presented by the German road.

\*\*\*

Writing from Taleahuano, Chili, South America, a correspondent says that in the southern part of Chili an automobile is unknown and that not more than one out of 50,000 inhabitants has ever seen one. In general the roads are so bad that to travel with even a bicycle it is necessary to ride through the fields. There are one or two motor cars in Santiago, which has 200,000 inhabitants. One of the cars belongs to Mr. Besa, the Chilean prime minister. Valparaiso, which is the second largest city of Chili, has an automobile which was donated to the fire department of the town. Thus, there are only three automobiles in that country, which has a population of 2,500,000.

\*\*\*

General Gallieni, governor of the Isle of Madagascar, a French colony, states that the use of automobiles in that country is becoming very general. In June, 1900, when the governor returned to Madagascar, he took with him two 12-horsepower and one 6-horsepower Panhard cars, these being the first automobiles imported into the island. The cars were used constantly, one by the governor in all his travels. In less than a year and a half over 21,800 miles were traveled in the three cars. At the time the automobiles were landed the roads were no better than those of darkest Africa, but the governor set about making existing roads ridable and began to build new ones. Ever since there has been a special good roads committee, and the governor claims that anyone who visited Madagascar would be astonished to see the remarkable improvements accomplished.

\*\*\*

About 100 automobilists accepted the invitation of the E. R. Thomas Motor Co. to listen to a lecture given by Fred Nehrbas at the factory in Buffalo, N. Y., on the evening of January 11. The new Thomas was chosen as the subject for illustration and lantern slides were used to show the interior parts of all



MOTOR AGE

MOTORING IN MADAGASCAR

bearings, steering gear, front and rear axles, transmission, motor, etc. Attention was drawn to the new sliding gear transmission showing the direct drive on the high speed without a gear in mesh, and the chain pull between bearings whereby the strain is divided equally between both bearings. It was also shown how easily the ordinary mechanic might remove any part without disturbing the alignment of the remaining mechanism of the car.

\*\*\*

The automobile has conquered the earth, the sea and the sky. This achievement may well rank as one of the wonders of the twentieth century. The automobile on land has come into such general use since the beginning of the century that it is almost commonplace. The automobile boat followed soon after and the waters have acknowledged its supremacy. Airships have successfully performed journeys of considerable length, and it has been demonstrated that they are not only possible, but practicable. The French and English are somewhat in advance of America in the matter of airships, but it is safe to venture the assertion that America will be entered in the first international cup race for airships. The new year is pregnant with possibilities, and great strides in the advancement of the motor and the consequent alleviation of the burdens of mankind may confidently be expected.

\*\*\*

Baron Arthur Rothschild, who died in December, was one of the most enthusiastic motorists on the old continent. He had a penchant for fast cars. In 1899 he went to the Nice race meeting, and while going over the La Turbie

road met a director of the Daimler company. After a few minutes of side by side driving the director started to race. The baron followed and it soon became a contest as to which had the fastest car. The director, who had a new Mercedes machine, reached the end of the road a good distance in advance of the nobleman. The latter immediately offered to buy the faster car and the transaction was concluded in a few minutes. The astute director then returned to Cannstadt, and came back 2 weeks later with another car. He again met the baron and they begun talking about the new machine. A trial of speed was arranged and at the finish the baron was far behind. He purchased the car and asked the director to always advise him whenever the company would turn out a faster car. At the time of his death the baron had a fortune in fast automobiles.

\*\*\*

There were displayed at the Salon d'Automobiles, Paris, 488 complete automobiles; 132 chassis; 262 motor bicycles and 281 motors. Of the 488 complete vehicles, 459 were pleasure cars and twenty-nine were purely commercial vehicles. Of the passenger vehicles, 408 were gasoline cars, thirty-four electrics, eleven steamers, five gasoline and electric combined, and one gasoline and hot air. Of the commercial cars, eighteen were gasoline, six steam and five electric. Of the 408 gasoline cars, 221 had four-cylinder motors, 156 had two-cylinder motors, twenty six had single-cylinder motors, and five had three-cylinder motors. Three of the 132 chassis had steam engines, and two had electric motors. All the others had internal combustion motors. Of these, there were seventy-eight of four cylinders, twenty-eight of two cylinders, seventeen of one cylinder, two of three cylinders, and two of six cylinders. The 281 detached motors shown comprised 159 single cylinders, seventy-three four cylinders, forty-four double cylinders, three triple, one six and one eight cylinder. The fact that there were so many single cylinders among the motors exhibited—while usually the four-cylinder patterns are in the majority—is because the greatest number of these motors were made especially for motor cycles. Two hundred and ninety-three of the 488 complete cars were shown with either limousine, coupes or other closed or folding tops.



MOTOR AGE

A SMALL GERMAN LOCAL CLUB ON A TOUR—THE AUTOMOBILE CLUB OF BRAUNSCHWEIG

# AMERICAN MOTOR LEAGUE

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## OFFICIAL BULLETIN

### THE AUSPICIOUS MOMENT

The rapid growth of the American Motor League in the last few months has demonstrated that the people are in sympathy with the movement, and as its work and purposes become better known the membership will grow still larger and the influence which it will exert will be far-reaching.

The primary object of the league was to make the motor carriage popular and to dispel public opposition and prejudice against its reasonable use. The first thing to be done was to unite all persons who are friendly to the use of the new vehicle, making an organization that would be national in scope. The national body is subdivided into state divisions, and these divisions are further subdivided into local consuls in the various towns. Each local body administers the affairs of the league in its particular locality and thus the country is thoroughly covered.

The league is becoming known to the public at large because of its strenuous efforts in behalf of the good roads movement, and this has appealed more particularly than any other feature of the work because all the people are more or less interested in good roads. A series of sign boards was prepared last fall, showing the proximity of dangerous hills, approaches to villages, etc., and these are being distributed over the country as fast as possible. These signs are not alone of benefit to motorists, but to the general public as well.

The league also provides its members with printed routes, maps and guide books by which touring may be facilitated and encouraged. It has collected a vast amount of data from all the states in the Union and will issue a road book for each state as soon as its membership in the league is large enough to warrant the expense. This work is under the direction of a national touring committee, and committees are being appointed in state divisions. The first book issued contained 146 map pages, including index maps, and showed the important routes in New York, New Jersey, Vermont, Massachusetts, Rhode Island and Connecticut. The routes mapped and described in this book covered a total road distance of over 3,500 miles.

When a local organization is formed a consul is appointed to represent it in an active way. When there are several consuls in the same place they form a consulate or board of consuls. These consuls superintend the putting up of sign boards and danger signals to warn and guide tourists and travelers in their par-

ticular locality, and they are also to lead and direct the agitation for better roads and streets in the home city. They prepare maps and descriptions of all local routes and send them to the national and state organizations, thus assisting in the work of preparing the books of routes and tours printed for the use of the league at large. The consuls also protect the members against the operation of arbitrary, unreasonable, oppressive and unlawful acts, and make such provision for their comfort and social enjoyment as may be deemed proper.

In anticipation of the great number of automobilists who will make the trip to St. Louis this year during the exposition, the league preparing a description of routes from all accessible points east and west from the Atlantic and the Pacific. These routes will be divided into three classes—routes from points east of St. Louis; routes from points west of St. Louis, and branch and miscellaneous routes connecting with the main or through routes. Members of the league can greatly facilitate this work by sending in any information regarding the roads which they have.

Following the gathering of the clans at New York this week comes the meeting at Chicago during the automobile show there. The league expects to awaken by it such a spirit of en-

terprise in the west that the membership in the Mississippi valley will be quadrupled within a few weeks. It can be done. It is up to the members to do it. The members are the league and the league is for the members. Co-operation can make of the league anything that its members want it to be. No plans for the bettering of motoring conditions are too far-reaching if the members once determine to assume the full value of their strength. Let Chicago mark a great beginning of a great undertaking in the west. There is no more auspicious time than now to write in the unfading script of good highways the name American Motor League clear across the continent; no better time than now to start the actual forging of a solid chain of co-operating motorists who shall touch the turbulent waters of Hell's Gate and the radiant waves of the Golden Gate.

### LETTERS FROM MEMBERS

Elizabeth, N. J.—In clearing the accumulations of weeks past in my library I find the enclosed circular relating to members of the league and a subscription to MOTOR AGE. I am a subscriber to three motor papers, but to aid in the cause of good roads and speedy locomotion as compared with the average horse the enclosed check for \$1 is forwarded with a request to have my name enrolled for the "official organ" as a member of the American Motor League.—CAPTAIN GEORGE PECK, Medical Director U. S. Navy.

New Bedford, Mass.—I have just received the circular letter issued by the A. M. L. I would be only too glad to join a league with such a beneficial purpose, and you will find my application enclosed. Relative to serving as consul, I will say that I will serve in that capacity if you desire it. There is a great amount of work ahead to bring the automobile into the station it deserves and the sooner the ranks are filled and a united effort put forth, the sooner it will attain that position. I see by the prospectus that you publish a list of official stations. As I am conducting a well lighted and steam heated station with ample storage and repair facilities, I would like the appointment for this city. My motto has always been, "A fair deal or none," and so far I have had no reason to change it. Hope that my membership and services may be of some benefit to the league.—H. K. WILSON.

Brockton, Mass.—I received your recent letter and have just got around to let you know that I will gladly co-operate with you in any way I can to help you out locally or otherwise. You may send me memoranda and any other information you wish. Therefore find enclosed \$2 for dues to the league. I received some time ago a letter from Mr. Ferguson in regard to the league and already had my mind made up to join, and your letter has capped the climax. I think the league is all right and capable of doing some good work.—ALONZO A. HOYT.

### THE AMERICAN MOTOR LEAGUE

is an organization to promote the interests of all users of motor vehicles; to ascertain, protect and defend their rights; to oppose and prevent the enactment of unreasonable and oppressive laws; to encourage the use of motor vehicles by agitation and instruction; to provide its members with printed routes, maps and guide books by which touring may be facilitated and encouraged; to promote the work of improving the public roads and the erection of proper guide boards, and other signs necessary to guide and warn the users of motor vehicles; to select and appoint official hotels, repair shops and supply stations where its members may obtain reliable service at reasonable rates.

### WHO MAY BECOME A MEMBER

*"Any man or woman, 18 years of age or over, of good moral character and respectable standing, friendly to the motor vehicle and its interests, shall be eligible to membership."*

(Constitution, Article 2, Section 1.)

The League is extending its membership in all parts of the country. We invite all friends of the movement to join and aid in building up a powerful organization.

NO INITIATION FEE. ANNUAL DUES \$2 IN ADVANCE, OR \$3, INCLUDING 1 YEAR'S SUBSCRIPTION TO MOTOR AGE.



# AUTOMOBILES and AUTO-BOATS

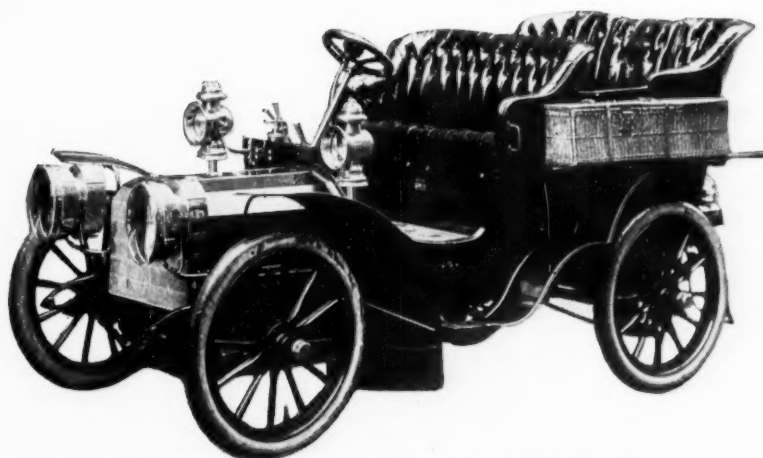
**F**oot Pedal Motor Control . . . . .  
 . . . . . NO HAND LEVERS FOR GAS OR SPARK

**I**gnition by Magneto . . . . .  
 . . . . . NO COILS, TREMBLERS OR BATTERIES

**A**utomatic Oil Conveyor . . . . .  
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**T**ested Thoroughly and Guaranteed .  
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ARE SOLD  
AS SHOWN.



WITH SEAT  
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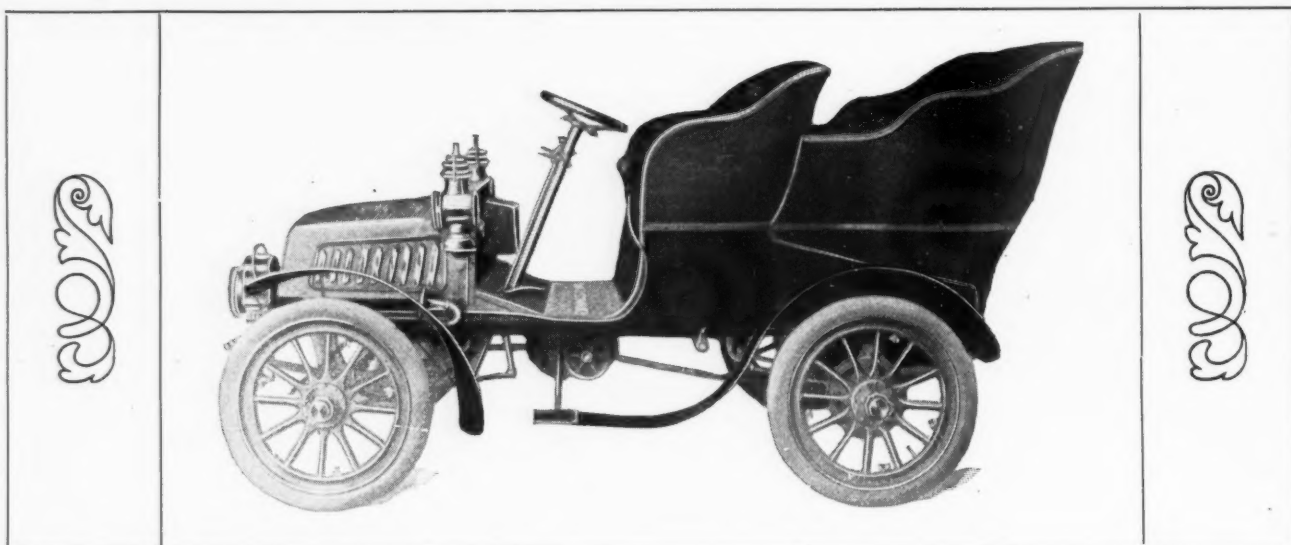
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So simple a child can run it  
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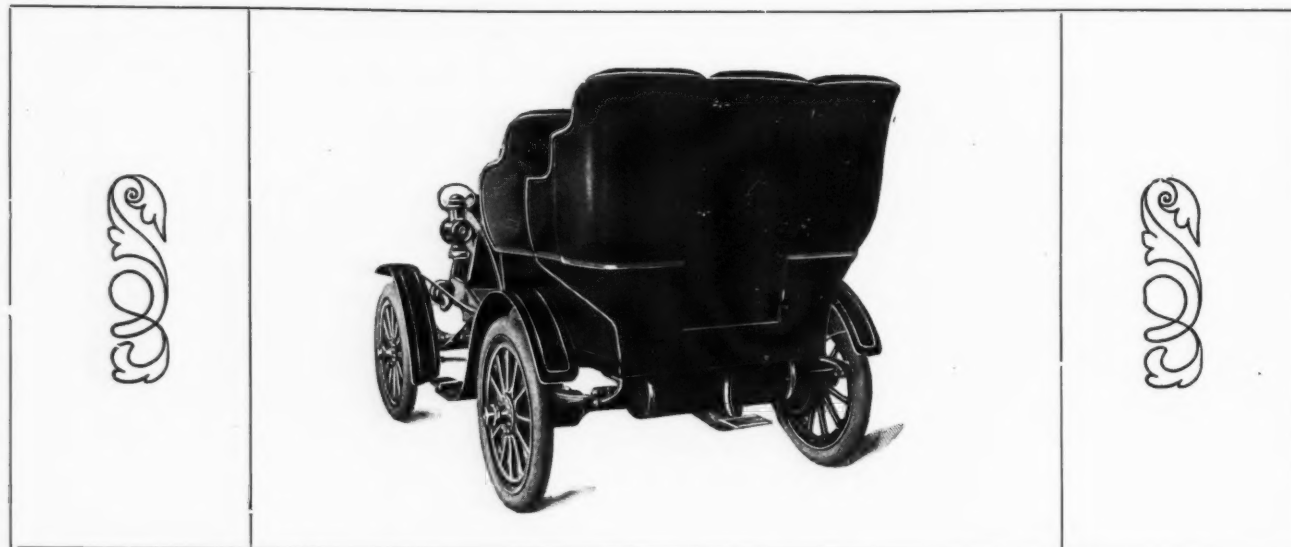
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15 B. H. P., two-cylinder upright motor, spur gear and positive clutch transmission, chain drive—no side levers, long wheel base—seats as roomy and comfortable as a Davenport, high grade honest work and material, superb finish. Will be exhibited at the New York and Chicago Shows.

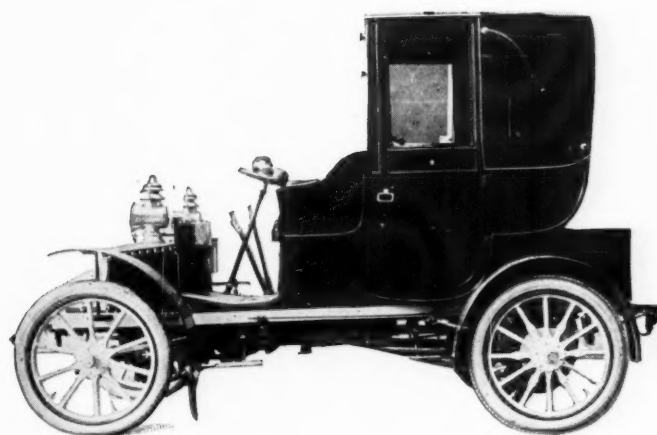
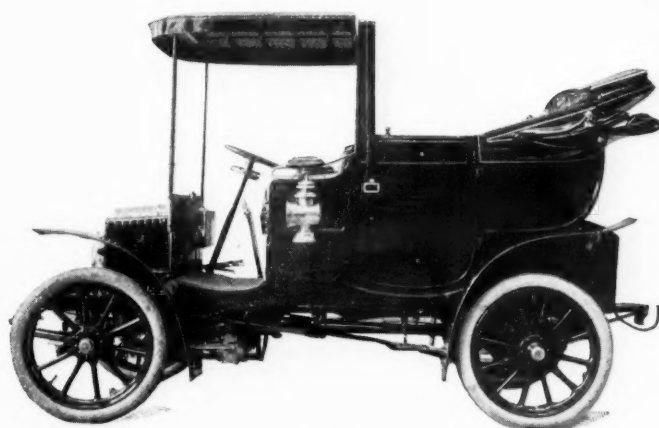
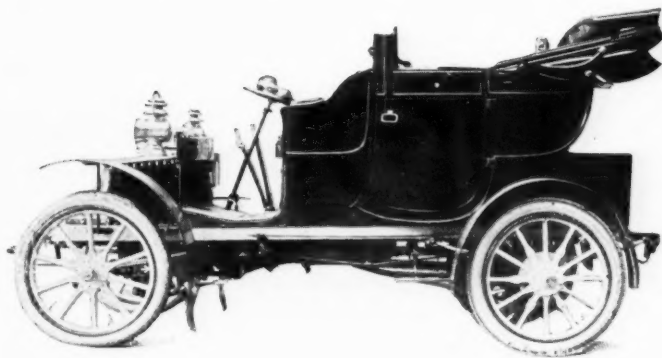
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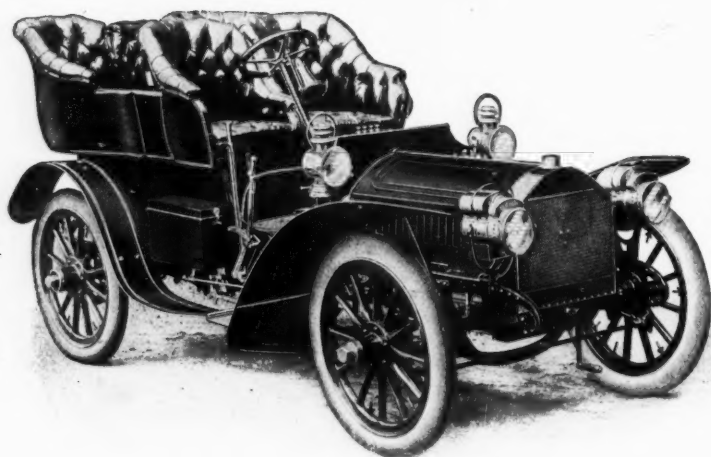
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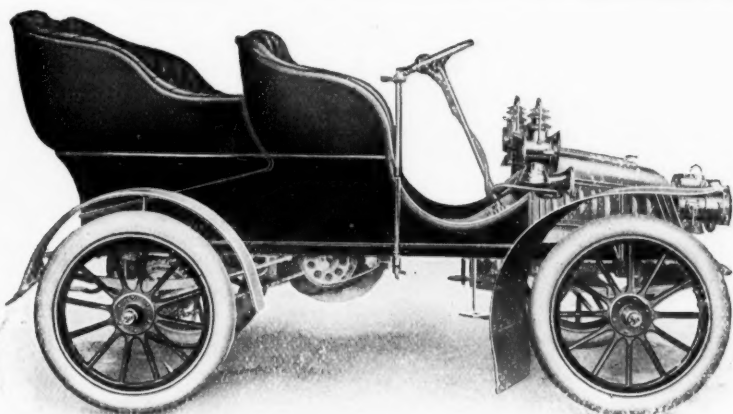
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WITH TONNEAU

Equipped with Tonneau  
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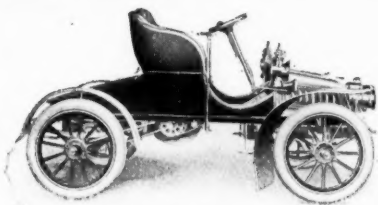
Without Tonneau, but  
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**\$1050**

**HORN and HEAD-  
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**With an Automobile of POPE QUALITY you are always on time**

These models maintain the same high standard which has always characterized the product of the Columbia Bicycle Factory, where the **POPE-HARTFORD** is produced



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STEARNS 24-HORSEPOWER GASOLINE TOURING CAR

Three of our 1904 Models will be on exhibition at Madison Square Garden,  
Spaces Nos. 119 and 120.

Our policy is **IMPROVEMENT**, not alteration.

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**STEARNS CARS CAN BE SEEN, NOT HEARD.**  
**REMEMBER THE RECORD OF NO. 35 IN THE ENDURANCE RUN.**

*Write for catalogue and booklet describing the  
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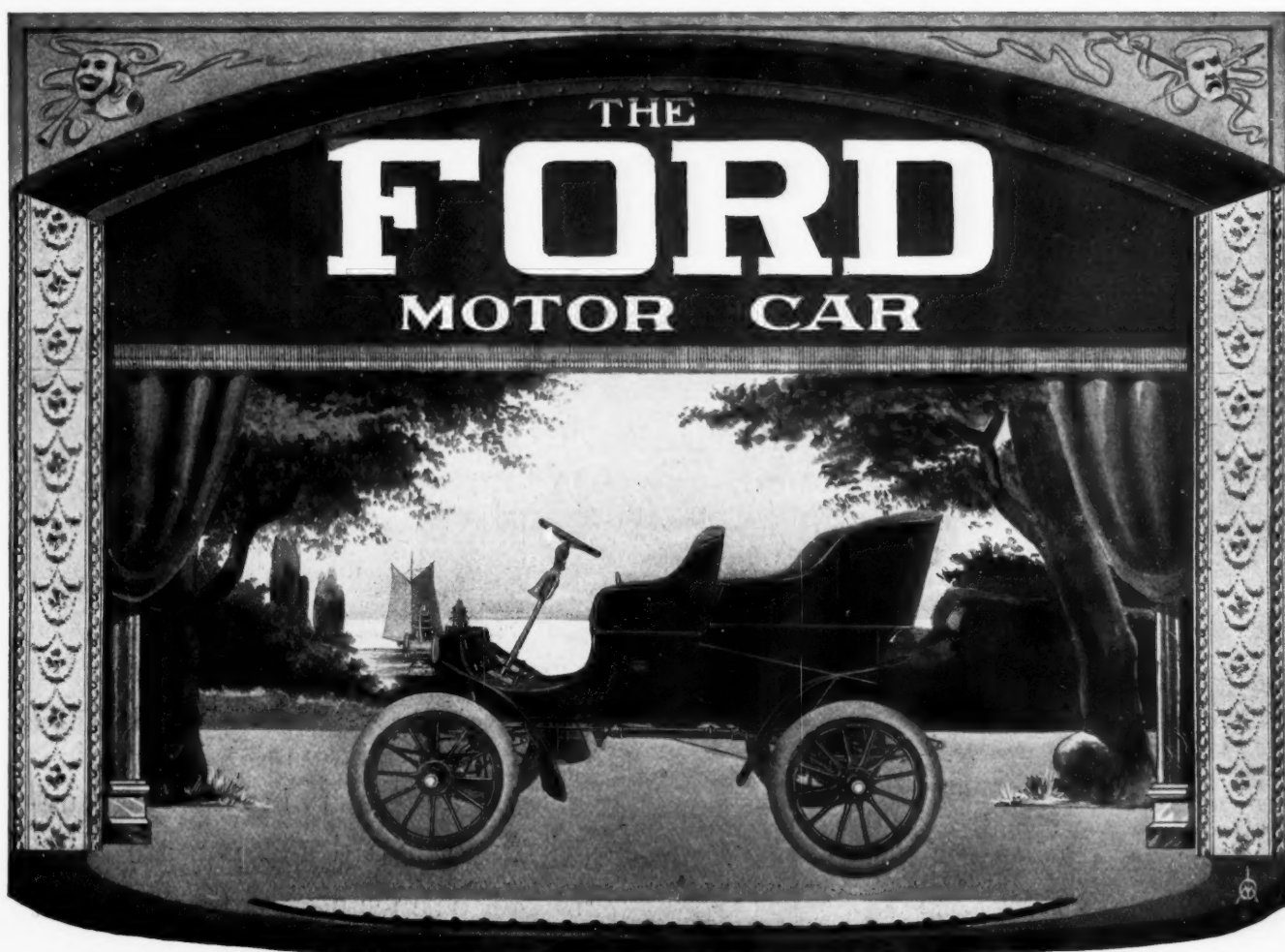
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The Ford is recognized by competent judges as the most advanced type of the motor car. Mr. Ford made the first Automobile in Detroit and the third in the United States.

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The Ford Motor has two opposed cylinders and gives eight actual horsepower. This does away with the vibration so noticeable on single cylinder machines. The transmission is very simple, only five gears are used, protected by an oil-tight dust-proof case.

The body is luxurious and comfortable, and can be removed entirely from the chassis by loosening six bolts. Standard equipment includes three-inch heavy detachable double tube tires.

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We agree to assume all responsibility in any action the TRUST may take regarding alleged infringement of the Selden Patent to prevent you from buying the Ford—"The Car of Satisfaction."

Visit our exhibit at the shows, or write for full information and name of our nearest agent, who will give you a practical demonstration of the car.

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# When You

go into a store to buy a pair of pants and the salesman offers to "throw-in" a pair of suspenders, you can't help but feel that somewhere in the price of the pants the cost of the suspenders have been included.

When a maker offers to throw in lamps, horn, freight, etc., you may be sure that these fixtures are included in the price. You may be paying a good many dollars more for your machine than dealers in far-away countries, and as a dealer you are being forced to sell sundries at a very short discount instead of a long one. If you

# Buy a Cadillac

you get just automobile, no suspenders are "thrown in." We believe you should handle the sundry business to suit yourself. We want to give you all the goodness we can, but we want it be all automobile. This is ONE reason why we can sell you so good a machine for so little money. The Cadillac is the machine you should handle at the price you ought to pay.

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Members of the Association of Licensed  
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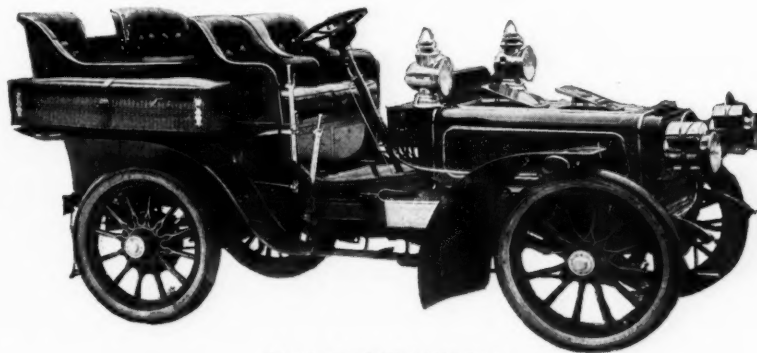


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Synonomous with Easy Running, Quietness, Strength, and Great Power.

The wide interest created in the Decauville on American tracks during the past season, and the favor it aroused at both the Paris and New York Shows, form eloquent testimony of its supremacy

On the 1904 four cylinder models, one feature, the patent steel pan, protecting all the working parts and found on no other motor car, is admitted the greatest advance in Automobile construction shown this year



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FIVE MODELS FOR 1904	{ 10 H. P. TWO-CYLINDER CAR
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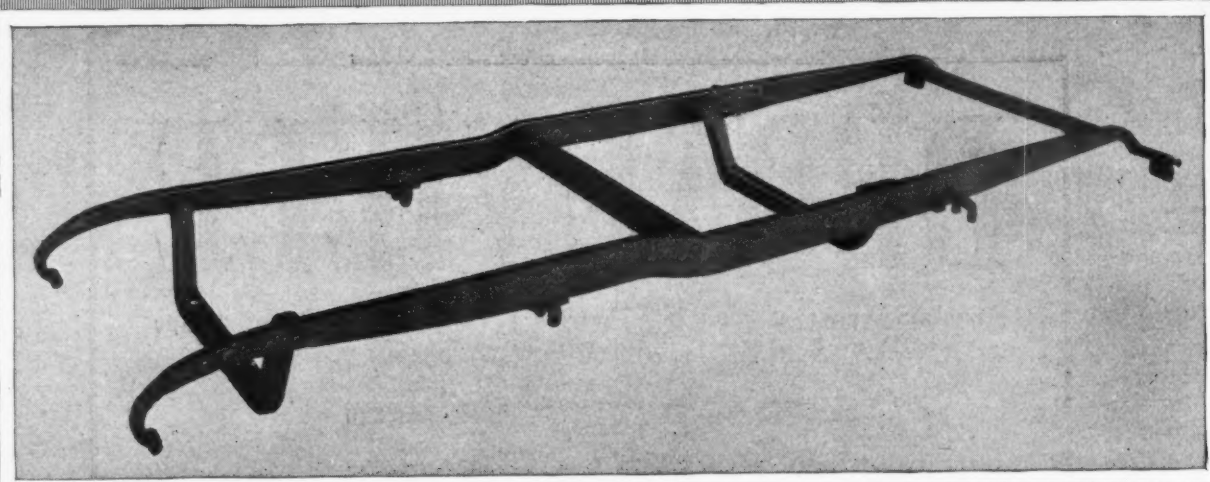
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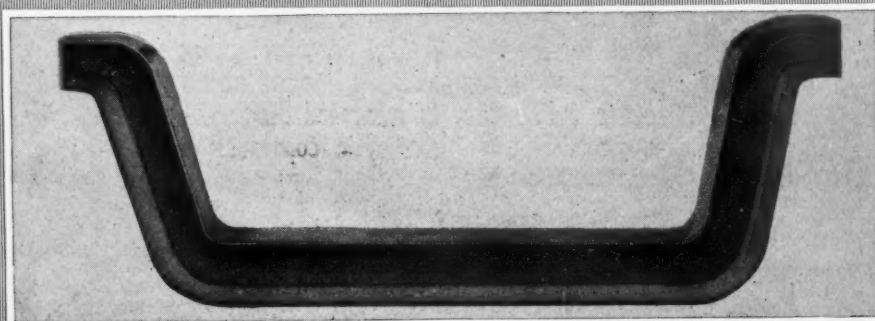
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# THE 1904 Haynes-Apperson

is the only Automobile of 1904 model that has been officially tested in a contest, and thoroughly tried out.

*Ours were the only 1904 models in the New York to Pittsburg Run and earned two First-Class Awards.*



Tonneau, \$2550 complete; \$2450 without top and front glass. For particulars see catalogue.

It shows fewer mechanical changes and contains more features that years of use have proved perfect in practice than any other, and is backed by an unequaled past record—seventeen contests entered—seventeen contests won, with stock cars.

*Most Haynes-Apperson cars have practically been sold before they were built. & Get your order in early.*

See Our Two Models at the New York and Chicago Shows.

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Detachable*  
**DUNLOP**



*The*  
**HARTFORD  
CLINCHER**

Introducing an entirely new departure in rim construction. ∴ Its detachable side flanges or beads are removed by the simple loosening of a screw, leaving a flat faced rim, from which the tire can be removed "like slipping a belt off a pulley"—a loose belt at that,

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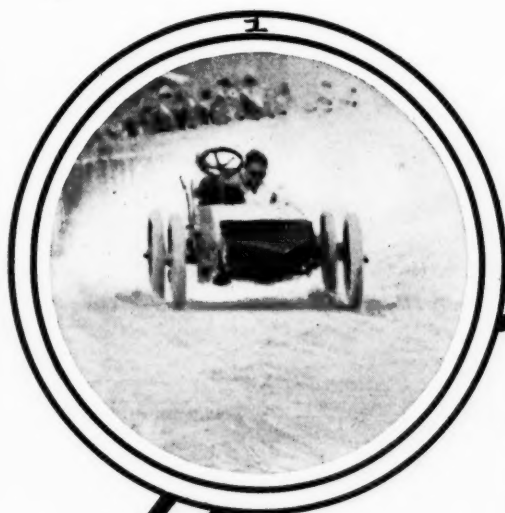
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BREAKING A RECORD WITH  
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Past performances on both track and road have conclusively proven that for speed, strength, safety and general excellence, no other rims approach

### STANDARD RIMS

Properly constructed from first quality open hearth, high carbon steel—electrically welded, they stand the twists and strains better, and lessen tire troubles to a greater extent than any other rims made. They're true in the beginning and stay true. The edges are as strong as the centers.

Ask Barney Oldfield, Mr. Paul Deming, Dr. Jackson, or 75 per cent of the country's auto builders and riders as to the superiority of Standard Rims.

Every Standard Rim bears the Tire Makers' Official Inspection Stamp. There are no Standard "seconds."

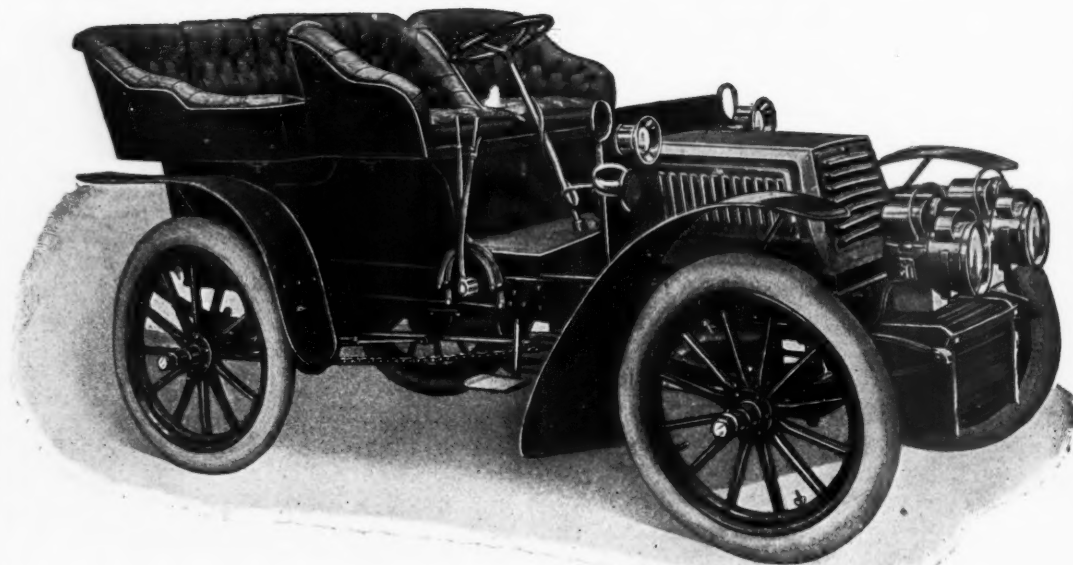
**Standard Welding Co.**  
Cleveland



**2 MR PAUL DEMING**  
WINNING PITTSBURG ENDURANCE RUN  
IN WHITE STEAM CAR  
STANDARD RIMS USED

**3 DR. JACKSON'S**  
WINTON CAR OF  
TRANS-CONTINENTAL TRIP FAME  
STANDARD RIMS USED

# APPERSON



## Touring Cars

**THE HIGHEST POWERED,  
MOST LUXURIOUS TWO-  
CYLINDER TOURING CAR  
EVER BUILT IN AMERICA**

Ample room for six passengers. **Two-cylinder opposed motor under bonnet—not under body of car.** Size of cylinders: 5 3-4 in. bore by 6 1-2 in. stroke. This car has run successfully during 1902 and 1903, and we offer no long list of excuses why it did not run last year. It has always been good, and is now more perfect than any two-cylinder car in use. Our customers are all satisfied. These cars are unquestionably the strongest in all parts, and are designed for American roads and hills. We offer in this car one which has been **thoroughly tried out during the last two seasons and found thoroughly satisfactory.** The price is moderate, and no risk to run in buying untried improvements

Write for large Catalogue.

**PRICE** Complete with Canopy Top and Folding Glass, full Curtains, full complement of Lamps, Tools and Supplies, f. o. b. Kokomo, Ind., **\$2850.00**

**APPERSON BROS. AUTOMOBILE CO.**  
KOKOMO Licensed under Selden Patent. INDIANA



# The OLDSMOBILE ABROAD



*The New Oldsmobile Light Tonneau Car. Nine Horse Power. Price \$950.*

The honor of representing the American Automobile Industry at the recent Paris Automobile Show fell upon the Oldsmobile, the only American car which had an exhibit at the big European event. Great interest was manifested in the various models of the Oldsmobiles shown, and over one hundred orders were taken on the spot. The success of the Oldsmobile abroad is as pronounced as it is at home. As many Oldsmobiles have been sold in Europe as all other American machines combined.

Be sure and see the new Oldsmobile Light Tonneau Car, and the Oldsmobile Touring Runabout at the Madison Square Auto Show, in spaces 75, 76 and 77; and the Chicago Auto Show, spaces 57, 58, 73 and 74.

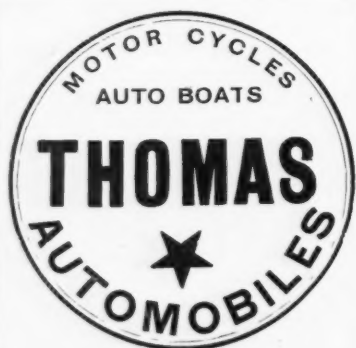
For further information about the new cars,  
see our nearest Selling Agent, or write direct to

## OLDS MOTOR WORKS

Members of the Association of Licensed Automobile Manufacturers.

1300 Jefferson Ave.,

DETROIT, MICH.



FOR CATALOGUES AND FURTHER  
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Boston.

**METROPOLITAN DISTRICT:**

Woolston & Brew, 152 W. 56th St.,  
New York City.

**MARYLAND:**

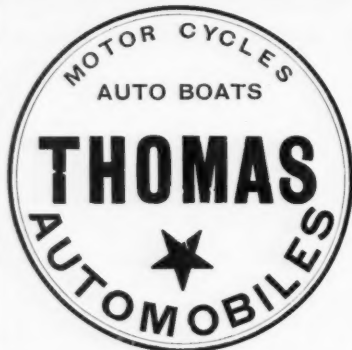
Baltimore Motor Car Co., Baltimore,  
Md.

**ILLINOIS:**

C. A. Coey & Co., 5311 Cottage  
Grove Ave., Chicago, Ill.

**BUFFALO:**

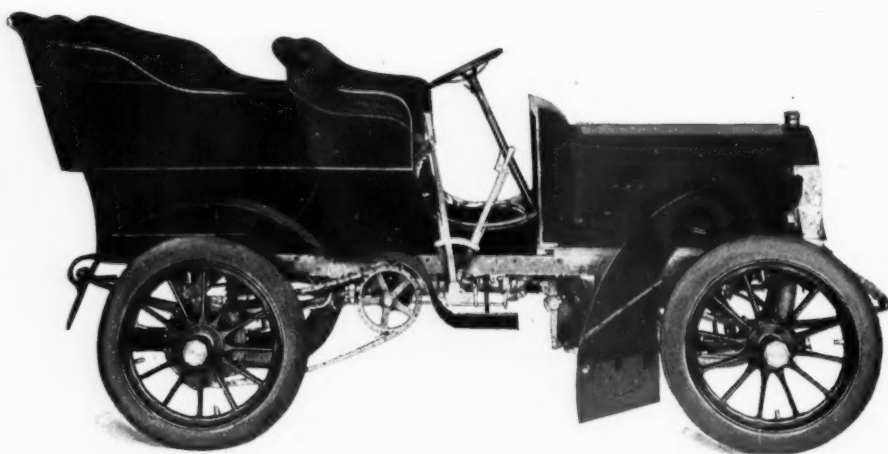
Buffalo Garage Co., 414 W. Ferry  
St., Buffalo.



# THE VERDICT

Rendered by the 200,000 New York  
Automobile Show Visitors: ∴ We,  
the Jury find unanimously that the

## Thomas "Flyer" Touring Car



# LEADS

All Competitors in the Following Counts:

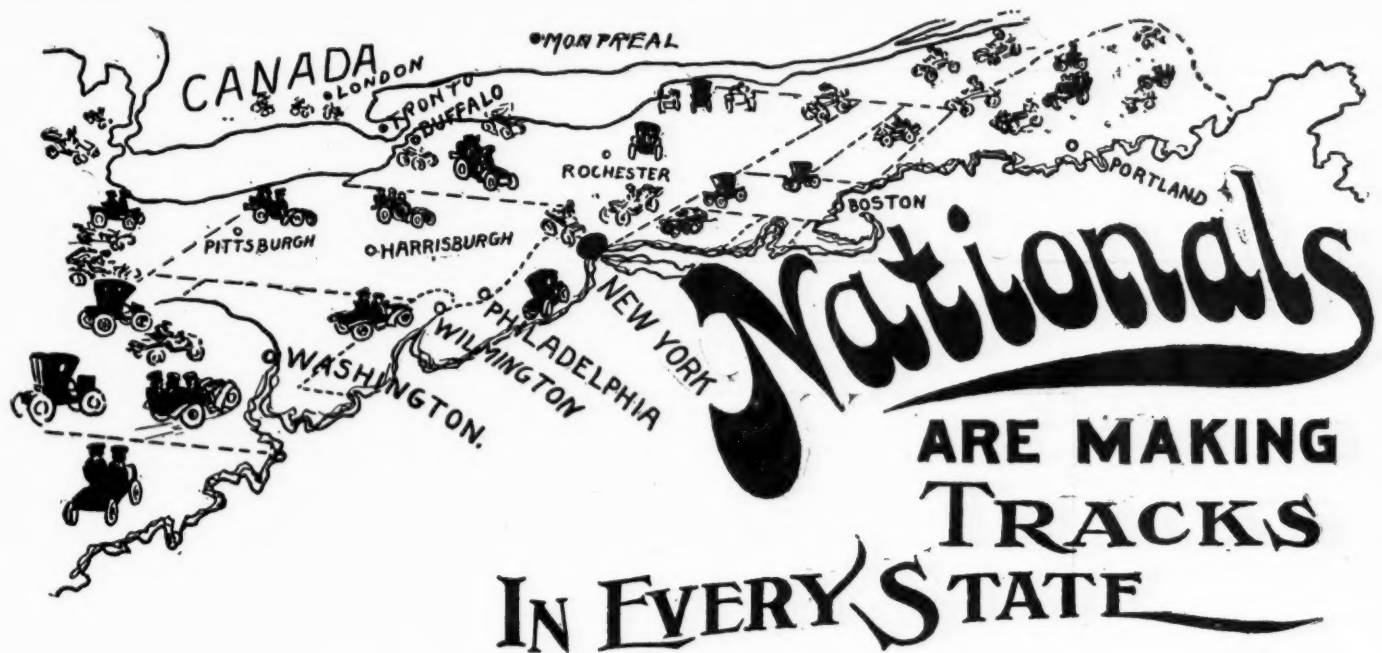
1. In beauty of design.
2. In elegant and durable finish.
3. In luxurious upholstery.
4. In comfort, roomy seats and tonneau.
5. In mechanical simplicity.
6. In lightness combined with strength and power, 83 lbs per horsepower.
7. In the Motor, 3 cylinder, 24 H. P., always in balance.
8. In having no vibration from motor or machinery.
9. In quiet running, like an electric.
10. In speed, from 1 to 50 miles per hr.
11. In having the best value at any price.
12. In being the best proposition for agents.

Manufactured by

**E. R. Thomas Motor Co.**

1202 Niagara Street, Buffalo, N. Y., U. S. A.





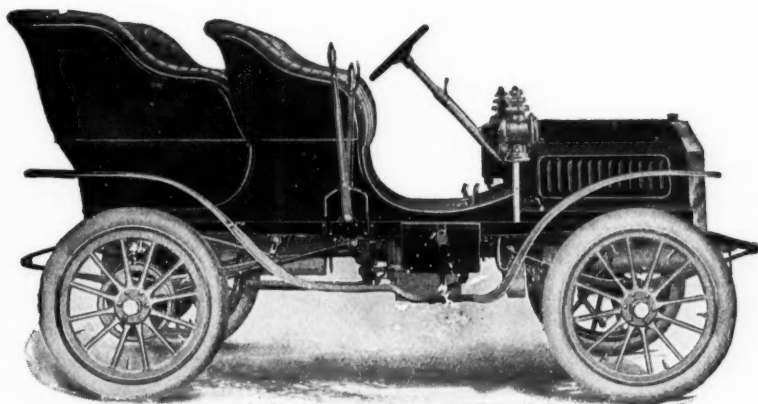
This week the Fourth Annual New York Automobile Show, at Madison Square Garden, New York, will be the Mecca of all Automobile Dealers. The particular Shrine will be the NATIONAL exhibit in Spaces 117 and 118, where will be shown a full line of

### *National Electric Vehicles*

consisting of Electrobiles, Runabouts, Road Wagons, Stanhopes, Park Traps, and a new Model designed to meet the special requirements of the Edison Battery.



### THE NEW *National Gasoline Touring Cars*



will also occupy part of our space, and we feel that their reception by the trade will be cordial. In fact every dealer that has examined them, or ridden in them so far, has secured the agency, or is laying his plans to obtain our line.

### THEY GO THE ROUTE

What more can be asked—to go the route requires that they “get there and back.” Don’t take our word for it, come down to the Show and be shown.

# NATIONAL MOTOR VEHICLE CO.

1200 22d Street, INDIANAPOLIS, IND.

Chicago Distributors: HAYDEN AUTOMOBILE CO., 1337 Michigan Avenue

# A TALE OF TRIUMPH

**T**HIS is the title of a fascinating little story of the "Pierce" cars in the famous Endurance Test of 1903, which has been prepared for free distribution by the George N. Pierce Co. It will be mailed to all who ask, together with the latest matter on the subject of the "Pierce Stanhope" and "Arrow Motor Car." All of these publications can be obtained of the dealers mentioned below and at the New York Show, Spaces 59 and 60. The "Pierce" cars have written for themselves "A Tale of Triumph." They have always "made good." All "Pierce" entries in the recent Endurance Test made every control on schedule time and were awarded Gold Medals. These models will be exhibited in New York and Chicago, together with our latest and greatest production, the "Great Arrow," a four-cylinder car of 24-28 h. p., embodying all the best and most modern engineering experience. The "Great Arrow" is the equal of any car produced in the world.

## THE GEORGE N. PIERCE CO.

Member of Association of  
Licensed Automobile Manufacturers



MAKERS,

BUFFALO, N. Y.

SPACES 59 and 60, NEW YORK  
19, 20, 35 and 36, CHICAGO

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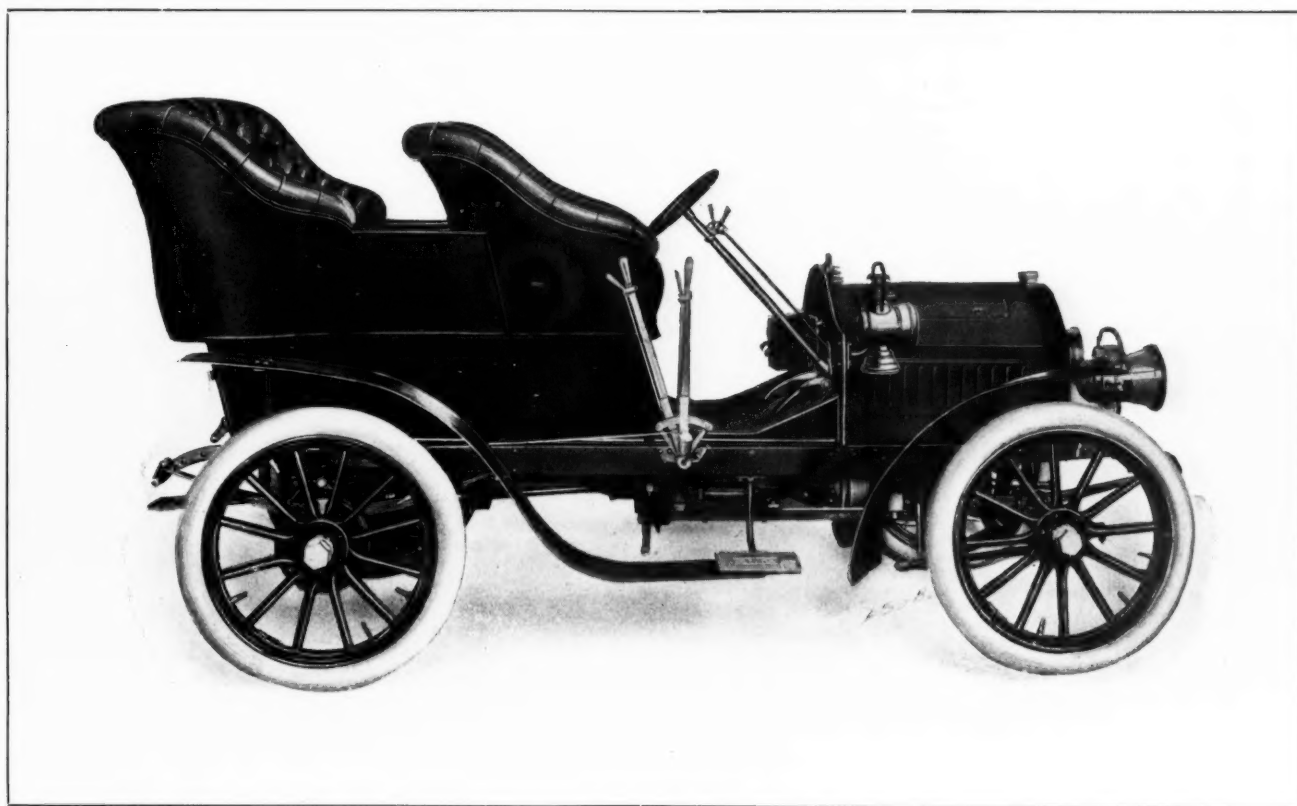
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32 Horsepower  
2,000 Lbs.

\$3,000



MODEL "K"

ALUMINUM BODY

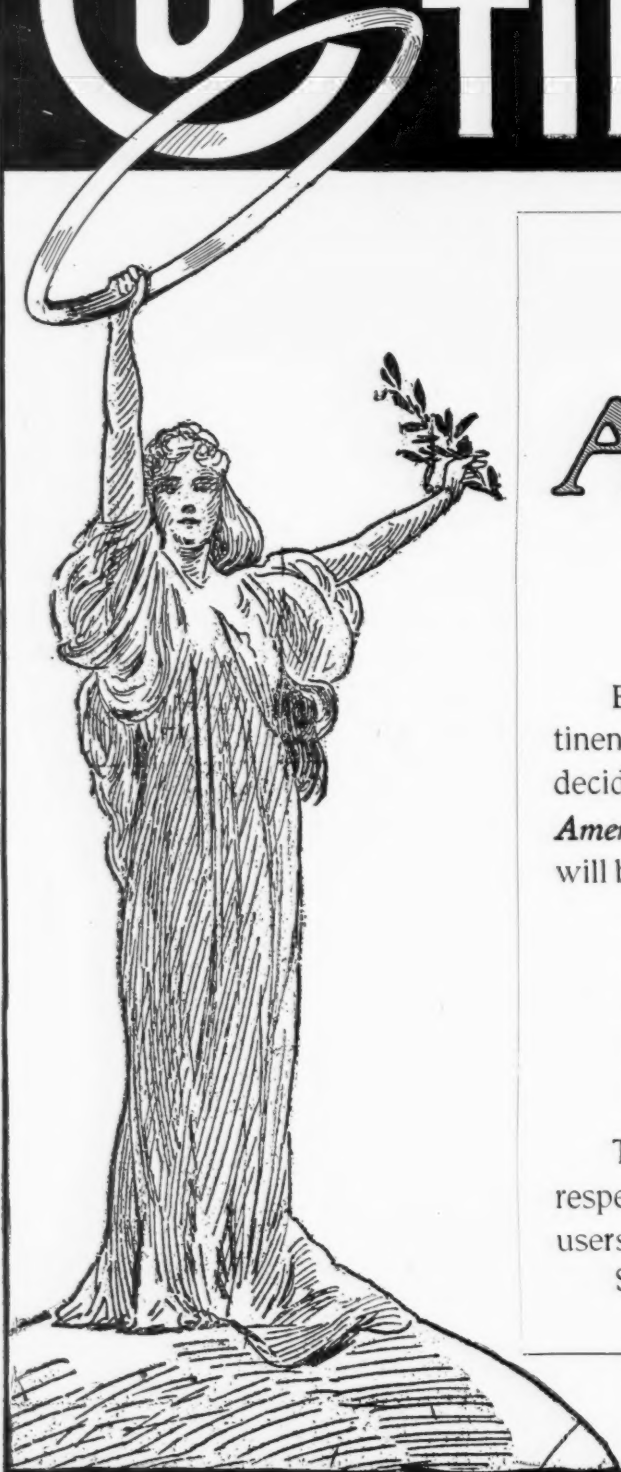
ROYAL MOTOR CAR COMPANY

CLEVELAND, OHIO

Formerly Hoffman Auto and Mfg. Co.



# Continental TIRES



## On American Cars

Encouraged by the wonderful success of Continental Tires in America, our factory in Europe has decided to make Continental Tires to fit *All American Cars* and beginning with February, we will be able to deliver these sizes in large quantities.

**Continental Tires are more numerous on high grade cars at the Madison Square Garden Automobile Show than any other make. They will also be very numerous at the Florida races.**

There is a reason for their popularity and we respectfully refer you to the thousands of satisfied users in Europe as well as America.

See us at space 200 Chicago Show and at Philadelphia, Detroit, Cleveland, Buffalo, Boston and Washington.

**Send for Price List.**

**CONTINENTAL CAOUTCHOUC COMPANY,  
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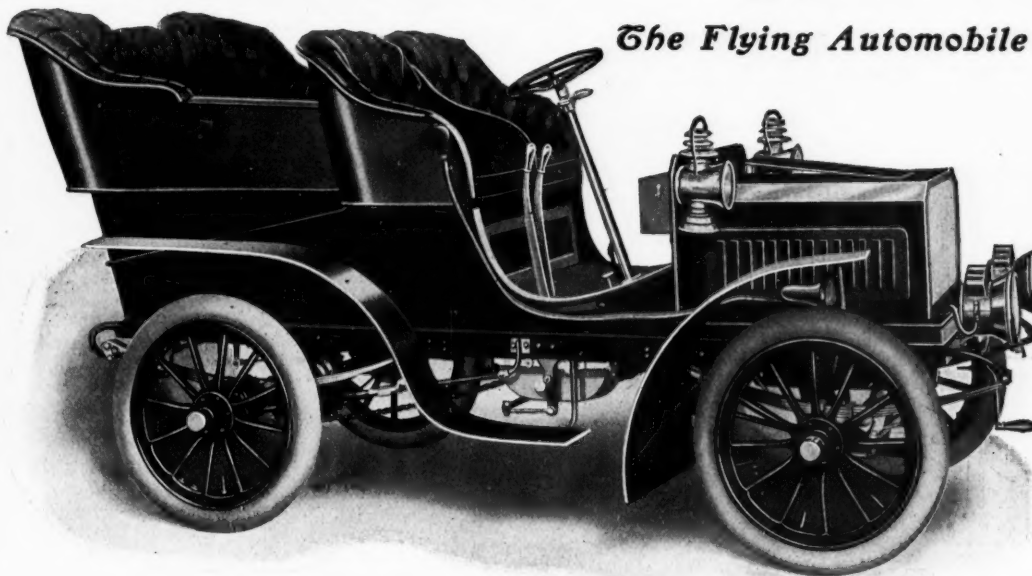


**\$2,000**

**AIR-COOLED**

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*The Flying Automobile*

Built to go. Easy riding. Four cylinders. Weight, 1800 pounds. Made to stand ample power. 20 horsepower. Over 1 horsepower to each one hundred lbs. Its elegance of appointment recommends it to people of quality. Agents should make inquiries before the Automobile Shows.....

**\$2,000**

**Columbus Motor Vehicle Co.**  
COLUMBUS, OHIO.

**\$2,000**

THE CHAINLESS

# WOLVERINE

A Live Proposition for Live Agents



A FEW OF ITS CHARACTERISTICS ARE:

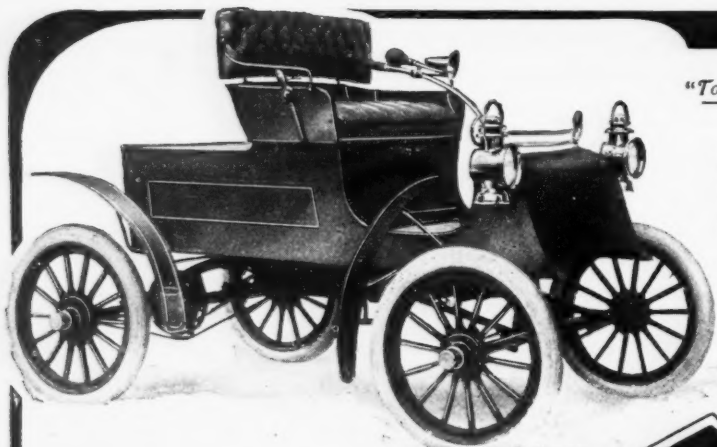
Bevel gear drive with sliding gear transmission, three speeds ahead and reverse.  
Speed range from 6 to 35 miles an hour.  
Long wheel base.  
Large high back tonneau.  
Finest leather upholstery.  
Space under tonneau floor to carry extra tire, rain covers, etc.  
Breaks positive and operated by foot.  
Wheels wooden of heavy artillery pattern, and fitted with 30x3½-inch Diamond Tires.  
Ignition by jump spark, automatically controlled.  
Sight feed oiling device on dash: 500 miles on one oiling.  
Beautiful in appearance and handsomely finished.

**Price \$1750**

**The Reid Mfg. Co., Detroit, Mich.**

New York Agents: DAY & CO., 60 W. 43rd St., near 5th Ave.

Exhibit at Madison Square Garden, Space 24 Basement or Exhibition Hall. Chicago: 128-129 Coliseum Bldg., Feb. 6th to 13th.



The  
Northern Runabout  
6½ Horse-Power  
Price \$750

*"To ride in a NORTHERN RUNABOUT—  
is to sit in the lap of luxury."*

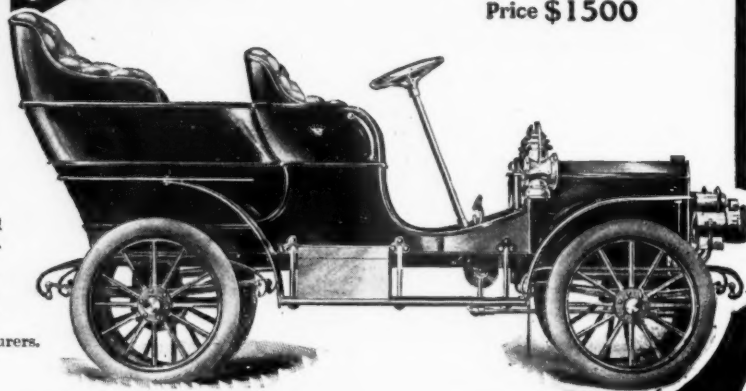
Its stylish outlines, handsome finish and appointments, independent body swing, strength and going-power make it the ideal runabout for appearance—for comfort—accomplishment.

# NORTHERN AUTOMOBILES

The  
Northern  
Touring Car

is a big, vigorous, handsome symmetrical machine for those who want a car of power and size. (Not a runabout with a tonneau tacked-on). Double Opposed Cylinder Motor, Direct Drive.

15 Horse-Power  
Price \$1500



Write for catalog and name of nearest agent.

NORTHERN MANUFACTURING  
COMPANY, Detroit, Michigan.

Member National Association of Automobile Manufacturers.

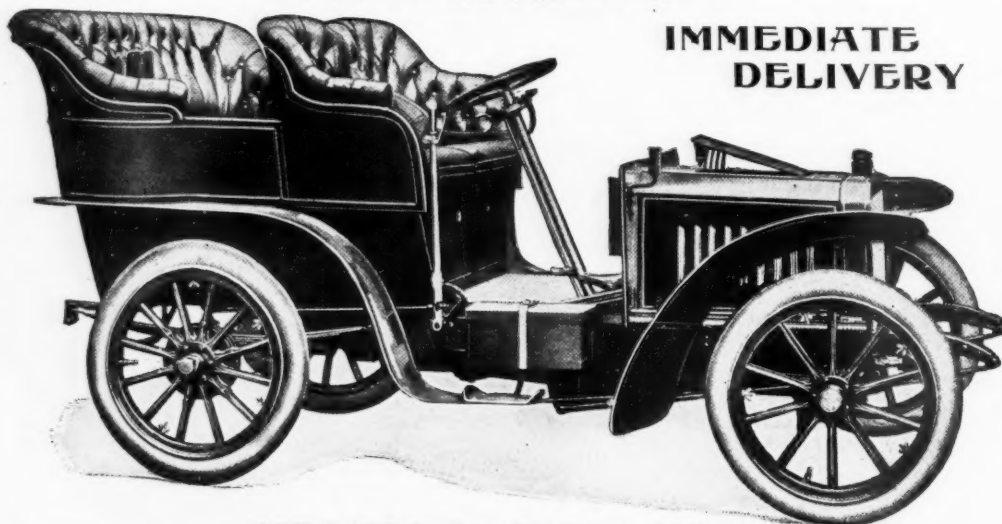
## Darracq Cars

For Mechanical Strength, Safety and Luxurious Appointments are Unsurpassed  
12, 15, 20, 24, 30, 35 Horsepower

IMMEDIATE  
DELIVERY

The Sales Attest  
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Improvements  
See Darracq  
Cars

15-20 H. P. 4-Cylinder, Honey Comb Radiator, Model 1904.

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American Darracq Automobile Co.

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Hudson St. and 147 West 38th St., New York.  
Licensed Importers Under Selden Patent, No. 549160.

BRANCHES: Chicago, Philadelphia, Boston, Pittsburgh.


See Our Exhibit at New York and Chicago Automobile Shows.





**'A horse! a horse!' cried Richard the Third,  
"I need the old plug as a fighter";  
But worse does the man with an old fouled plug  
Feel the need of a BULLOCK IGNITOR!**

*Will be at the New York Show, Spaces 135 and 136*



**ANY THREAD**

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CLEVELAND, OHIO**

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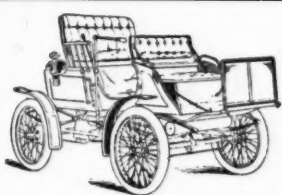
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**CATALOGUE.** Our handsome new catalogues, giving full particulars and much interesting information, will be mailed on request.

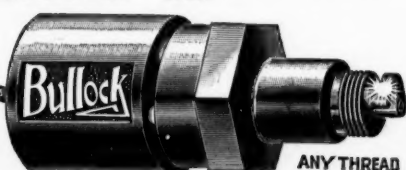
*Write for Liberal Agency Proposition.*

**MADISON SQUARE GARDEN,  
SPACES 44 and 45.**

**Prescott Automobile Mfg. Co.**  
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**Throw your induction coil to the dogs!**

**THE BULLOCK IGNITOR**




**ANY THREAD**

*The doggoned thing is no good anyway, and you will need it no longer.*

is not an induction-coil or spark-plug, nor any combination of the two, but is an entirely new electrical device similar in form to an ordinary spark-plug; and with current from batteries or dynamo produces what is in effect a jump-spark or continuous flame, which is unaffected by oil or soot.

There are no nuts or screws to work loose while on the road, and no adjustments of any description to puzzle or confuse. The workmanship is of the best, and the construction, while practical, is both simple and substantial. The spark can be timed, the same as the common jump-spark.

Our proposition will not interest you unless you have been "thro the mill" (broken-down coils, fouled plugs, etc.), and are looking for something better.



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**THE BULLOCK-BERESFORD MFG. CO.**  
CLEVELAND, OHIO.

*Mention this publication when sending for printed matter.*

39<sup>2</sup>/<sub>5</sub> Sec.

..WORLD'S MILE RECORD..

39<sup>2</sup>/<sub>5</sub> Sec.

Made by HENRY FORD, at New Baltimore, Michigan, January 12, 1904, driving the famous **Red Devil Racer 999**, fitted with a

# KINGSTON CARBURETER

Which proves that for producing POWER AND SPEED the KINGSTON CARBURETER has no equal.

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 **Automobile Motors**

One, Two, Three and Four Cylinders

Sliding Transmission Gears and Circulating Pumps. Marine and Stationary Motors and Launches. Get our prices before placing your orders. Send for Catalogue

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THE IDEAL LIGHT CAR  
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Superior in Construction. Efficient under All Conditions.  
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Simplicity, Reliability, Lightness and Strength are combined in its make-up.

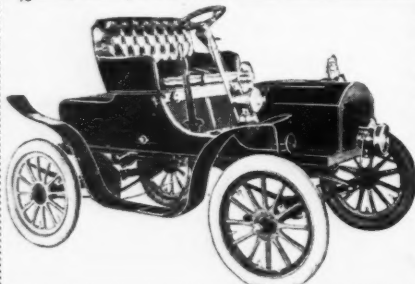
PRICE, COMPLETE, \$750.

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Send for Illustrated Catalog.

## The Courier

Built for American Roads

Mud, Sand and Hills shrink before it. A model of simplicity. Quiet, Safe, Powerful and Economical.



More power per pound than any other car on the market. Cylinder 4<sup>3</sup>/<sub>8</sub> x 5<sup>3</sup>/<sub>8</sub>. The only Runabout equipped with sliding Gear Transmission on the market to-day. Agents wanted. Write for prices and catalogue.

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you run an automobile and use coil and plug ignition,  
**YOU WANT THE BEST PLUG** you can get.

**THE L'OLEO** MADE IN FRANCE,

will meet with your approval. Its advantages: Non-foulable, full spark, strongly made, proof against soot, long life, automatic gas chamber, discharging all oil and carbon. **\$1.50 each**

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**Going to Ride?** For Pleasure? How can you enjoy it while in constant fear of collapsed tires? On Business? Time is money, and you want no mishap on the way. **The Tennant Pneumatic Puncture-Proof Tire** on your auto guarantees both pleasure and safety. It can neither be punctured nor deflated by cracking or breaking of the inner tube. Our free catalogue, sent on request, tells all about it.

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SEE MY EXHIBIT AT  
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**CHICAGO SHOW**

FEBRUARY 6-13, 1904

**EMIL GROSSMAN**

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## THE Cinderella Jack

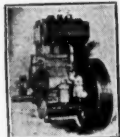
Stands low enough to lift 28-inch collapsed tires up to highest carriage wheels. Weighs 4½ lbs. Guaranteed for two-ton Autos and 2,500 lbs horse-drawn carriages, price \$3.00. Ask Your Dealer or delivered in United States or Canada. Send for catalogue.

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8 H. P., 2 Cyl.  
ALUMINUM CASE  
GOVERNED.

By Using my  
Motors, Transmissions,  
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Steering wheels Steering knuckles  
Solid, tilting and sliding Parts for running gears  
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White Car No. 5, operated by Webb Jay, was not only awarded a Gold Medal but reached Pittsburg first, and was first into FIVE of the EIGHT CONTROLS

## THE MOST RELIABLE AUTOMOBILE

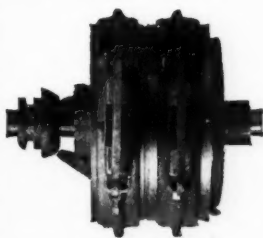
BUILT TODAY, REGARDLESS OF MOTIVE POWER, WITHOUT ANY EXCEPTION WHATEVER

Steam the Motive Power, but the Boiler and its worrisome water-level are not present. Entirely Automatic Water-feed and Fuel Regulation. High Economy Compound Engine. Chainless Drive, and a Condenser whereby the Water is used over and over again.

100 MILES ON ONE FILLING OF GASOLINE AND WATER. TOTAL WEIGHT 1600 Lbs.

**WHITE SEWING MACHINE COMPANY CLEVELAND OHIO**

## The Ball Transmission Gear for Automobiles and Launches



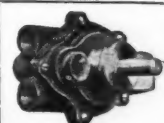
PATENTED  
April 9, 1901. Nov. 3, 1903.  
Jan. 12, 1904.

Two Forward Speeds and a Reverse. Made entirely of Spur Gears cut from Steel Blanks with Hardened Teeth, Running in Oil. No Internal or Bevel Gears.

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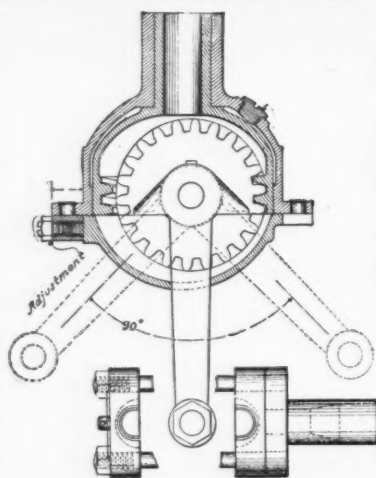
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Positive Circulating Pump. Brass or Aluminum

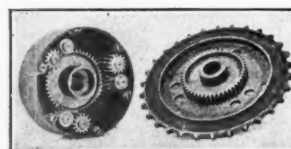
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BEST MADE FOR  
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Nine models of equalizing gears for chain or direct drive. Special differentials when stock sizes won't meet requirements. Two sizes of back lock steering gears; Easy to Steer, Safe, Strong and Durable.

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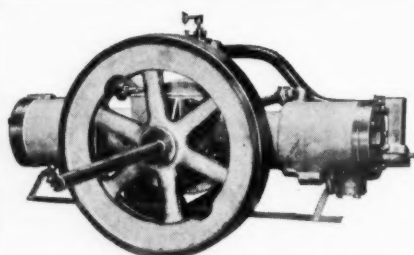
## SPRINGS

OIL TEMPERED. HAND FITTED.



ALL KINDS FOR AUTOMOBILES

**THE CLEVELAND-CANTON SPRING CO., Canton, Ohio**



## THE BUCKEYE

Horizontal, Two-Cylinder  
Opposed

## MOTOR

12 H. P.

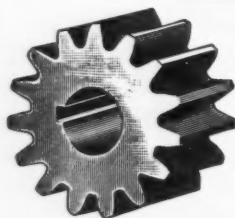
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Spur Gears, Bevel Gears, Spiral Gears, Worms and  
Worm Gears, Internal Gears.



Internal Gears require only 3-16  
inch space between Gear  
and Web.

If you want perfect Gears send them to  
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## AUTOMOBILE AXLES COMPLETE

With Hyatt Roller Bearings

ARTILLERY AND WIRE **WHEELS** For Any  
Weight Vehicle

ALL SIZES **RIMS** FOR ANY TIRE

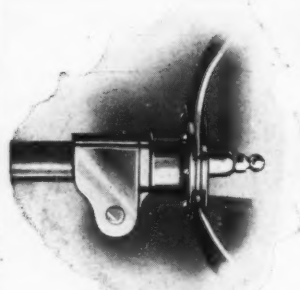
Every Clincher Rim is **INSPECTED** by Clincher Tire Association, bears  
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Established 1884.

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OF EVERY DESCRIPTION

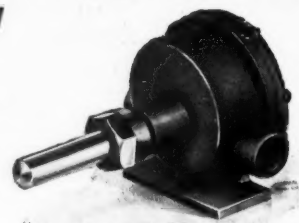


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Ball Races  
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# NOTICE

USERS, AGENTS, IMPORTERS, DEALERS AND  
MANUFACTURERS OF

## Gasoline Automobiles

United States Letters Patent No. 549,160, granted to George B. Selden, November 5, 1895, controls broadly all gasoline automobiles which are accepted as commercially practical. Licenses under this patent have been secured from the owners by the following named:—

### MANUFACTURERS

Electric Vehicle Co.  
The Winton Motor Carriage Co.  
Packard Motor Car Co.  
Olds Motor Works  
Knox Automobile Co.  
The Haynes-Apperson Co.  
The Autocar Co.  
The George N. Pierce Co.  
Apperson Bros. Automobile Co.  
Searchmont Automobile Co.  
Locomobile Co. of America  
The Peerless Motor Car Co.  
U. S. Long Distance Automobile Co.  
Waltham Manufacturing Co.

Pope Motor Car Co.  
The J. Stevens Arms & Tool Co.  
H. H. Franklin Mfg. Co.  
Smith & Mabley, Inc.  
The Commercial Motor Co.  
Berg Automobile Co.  
Cadillac Automobile Co.  
Northern Mfg. Co.  
Pope-Robinson Co.  
The Kirk Mfg. Co.  
Elmore Mfg. Co.  
E. R. Thomas Motor Co.  
Buffalo Gasoline Motor Co.  
Pope Manufacturing Co.  
The F. B. Stearns Co.

### IMPORTERS

Smith & Mabley, Inc.  
Central Automobile Co.  
Alexander Fischer.  
Hollander & Tangeman  
Sidney B. Bowman Automobile Co.

Standard Automobile Co.  
E. B. Gallaher  
Auto Import Co.  
American Darracq Automobile Co.  
Controlled by F. A. La Roche Co.

These manufacturers are pioneers in this industry and have commercialized the gasoline vehicle by many years of development and at great cost. They are the owners of upwards of four hundred United States Patents, covering many of the most important improvements and details of manufacture. Both the basic Selden patent and all other patents owned as aforesaid will be enforced against all infringers.

No other manufacturers or importers than the above are authorized to make or sell gasoline automobiles, and any person making, selling or using such machines made or sold by any unlicensed manufacturer will be liable to prosecution for infringement.

A suit was commenced on Oct. 22d against a dealer, and against a manufacturer infringing United States Letters Patent No. 549,160.

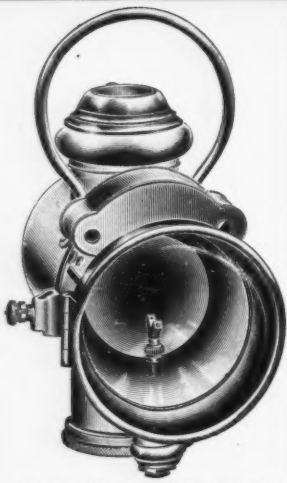
A suit was commenced Nov. 5th, against a purchaser and user of an automobile infringing the same patent.

A suit was commenced December 28th, 1903, against an importer of automobiles infringing the same patent.

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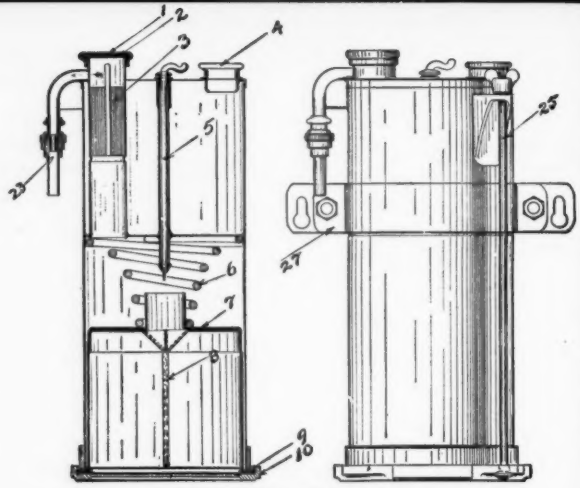
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Association of Licensed Automobile Mfrs.  
No. 7 EAST 42d STREET, NEW YORK



Columbia Auto Headlight

# Columbia Line of Lamps



SEPARATE GENERATOR

The Columbia Generator for detached head is in all aspects the same as the generator used in our standard size Auto Headlight. It is provided with adjustable bracket, that can be attached to stationary bolts or screw heads provided inside the vehicle or wherever wanted.



**COLUMBIA DETACHED HEAD**—The Detached Head is in all Respects Like the Auto Lights Just Described, but Having no Attached Generator Depending  
**DETACHED HEADLIGHTS** Can Be Used Singly or in Pairs to Suit the Purchaser



**COLUMBIA AUTO HEADLIGHT**—Has Gas Cock. Burns Out Charge Completely. German Silver Reflector. A Powerful Searchlight.



Columbia Auto Jack



Columbia Dash Bracket

**Use Your Columbia Lamp on Your Buggy, Carriage and Automobile**



**Columbia AUTOMATIC Gas Lamp** for Bicycles, Buggies and Motor Vehicles or for Tail Light



Columbia Oil Side Light

## SIX YEARS OF EXPERIENCE

has demonstrated our system of acetylene gas generation to be the simplest and most reliable system yet devised. All models may be operated in the same manner as your Old Oil Barn Lantern.

Many improvements for 1904.

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**Columbia Auto Light**—Has Gas Cock. A Headlight for Small Automobiles. A Powerful Side Light for Large Machines



# There Is Nothing Missing

IN THE RAMBLER LINE FOR 1904

For boulevard riding and on good roads the

**Rambler** MODEL "E"  
\$650.00

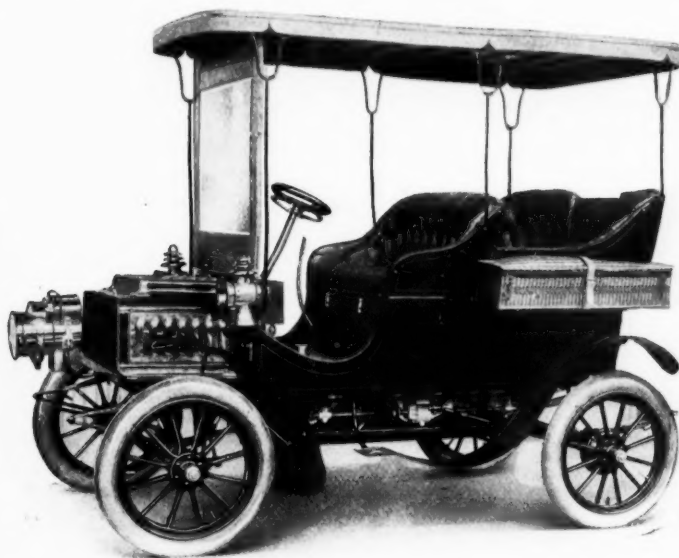
is best adapted because of its lever steering and quick turning abilities. For two persons on any kind of road the

**Rambler** MODEL "G"  
\$750.00

is constructed. With wheel steering, long wheel base and square bonnet, it is the ideal light touring car, and is capable of 20 to 25 miles an hour on ordinary roads, and of surmounting ordinary grades on the high speed and all grades on the low gear. For four and, in emergencies, five persons, the

**Rambler** MODEL "H"  
\$850.00

cannot be excelled. It is the Model "G" with the addition of the tonneau, and is the most powerful of the light touring cars now sold. It is graceful in its lines, remarkable for its ease of riding, and is the only car on the market, at its price, that embodies the French and fashionable type of body.



Rambler, Model "L"



Rambler, Model "H"

MODEL "J" **Rambler**  
\$1,100

is for those who like speed and great surplus of power. It will carry two persons over any road and over all ordinary hills on the high speed, and is capable of from 35 to 40 miles per hour on good roads. It is furnished with a two-cylinder engine and has a greater surplus of power than any car made or sold at twice its price.

MODEL "K" **Rambler**  
\$1,200

is the same carriage with the tonneau attached. The latter is distinct from others in that it is roomy and comfortable, two persons riding with ease, and a small seat for the third when required. This model is equipped with brass side lamps, gas headlight, brass tail light and tube horn, and necessitates no further expenditure to fully equip it for touring. Our edition de luxe, the

MODEL "L" **Rambler**  
\$1,350

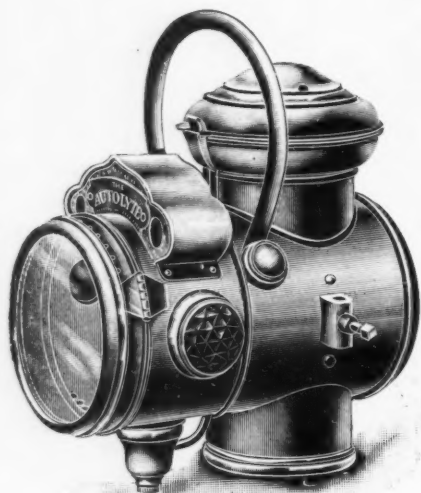
is the high water mark of automobile building, and cannot be duplicated for twice its price. It has the large two-cylinder engine, long wheel base and full elliptic springs, and is further equipped with canopy top and waterproof curtains completely enveloping the car; swinging plate glass front, full size brass headlight, side lights and tail light, willow side baskets and long tube horn. No further accessories are necessary, it being complete in every detail.

Our Advance Catalogue will shortly be out; let us mail you a copy, together with a history of the RAMBLER part of the recent Endurance Contest.

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BRANCH HOUSES: 304 Wabash Avenue, Chicago; 145 Columbus Avenue, Boston, Mass.

# The Light of the Show



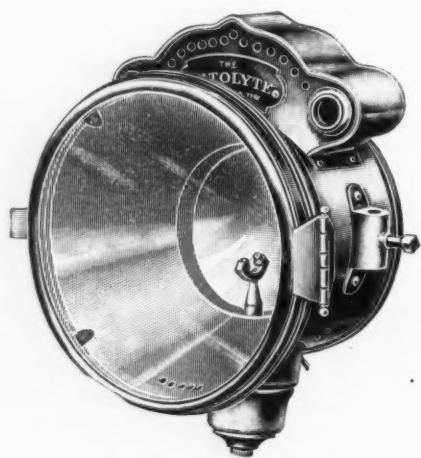
**No. 23, Price \$20.00.**  
Diameter, 5½ inches; Depth, 10½ inches;  
Height, 13 inches.

## AUTOLYTE GAS LAMPS

# 1904

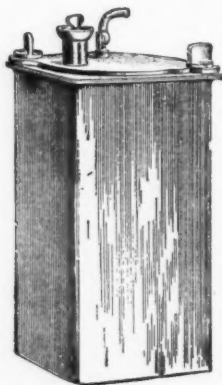


**No. 25, Price \$35.00.**  
Diameter, 8½ inches; Depth, 13½ inches;  
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**No. 24F, Price \$12.50.**  
Diameter, 7 inches.

**No. 25F, Price \$16.00.**  
Diameter, 8½ inches.



**14A Generator, Price \$12.50.**



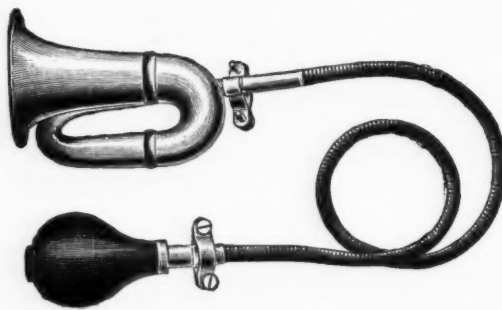
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Lens Mirror Searchlights,**

**No. 26, Price \$27.50.**  
Diameter, 7 inches.

**No. 27, Price \$40.00.**  
Diameter, 7 inches.

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DENVER—  
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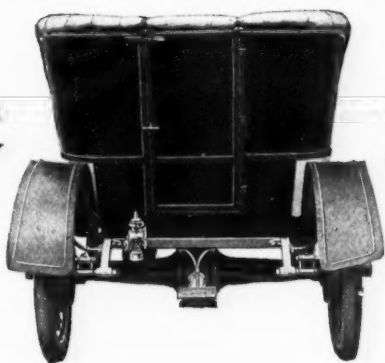
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Maximum  
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THE CAR LEAST EXPENSIVE TO  
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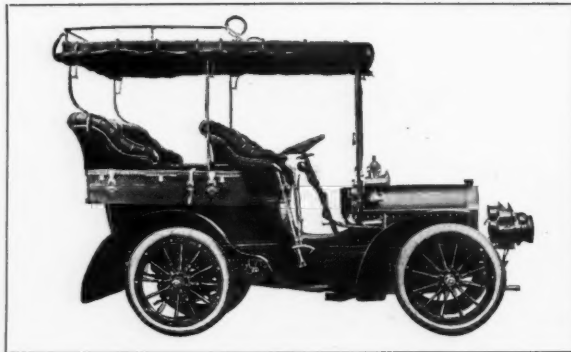
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# Gasoline Touring Cars

Equal in materials and workmanship to the best Foreign Cars but — **BETTER ADAPTED TO AMERICAN CONDITIONS** on account of ample clearance, interchangeable parts, etc.



Special attention paid to the selection and testing of materials. Every motor is given a special test under load. Every complete chassis is tested on the road for several hundred miles before finishing.

## A New Four-Cylinder Touring Car with Cellular Radiator

Better place your order now for early spring delivery, many others are doing so.

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BEVEL GEAR DRIVE  
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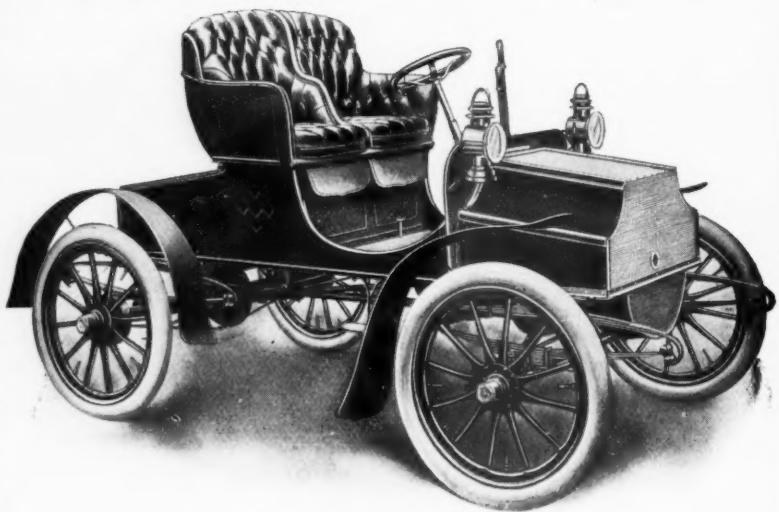
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All of which we will have on exhibition at the Fourth Annual Automobile Show in New York and the Third Annual Automobile Show in Chicago.

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the most complete line of Light and Medium Runabouts, Light Deliveries, Medium and Large Touring Cars ever before offered. AIR COOLED—by Fans; SHAFT DRIVE—No Chain Troubles; NO VIBRATION—All Machinery on Frame; Ample Power; Simplicity; Design; Superb Finish; Lightness and Strength Combined. OPTION—Wheel or Lever Steer, Tread, Color.

**Ours** is the most attractive proposition on earth for **Live Agents**

Light Runabouts, = \$600  
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Price, \$850.00

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comprise the leading vehicles which made the COLUMBIA name famous during 1903, and several entirely new models, including our MARK LX ELECTRIC RUNABOUT, the fastest and handsomest auto in its class as well as the lightest of equal battery power; also our new 12 h. p. LIGHT GASOLINE TONNEAU, with double opposed cylinder engine in forward bonnet and automatic features of control, which make it easier to operate than any other gasoline car.

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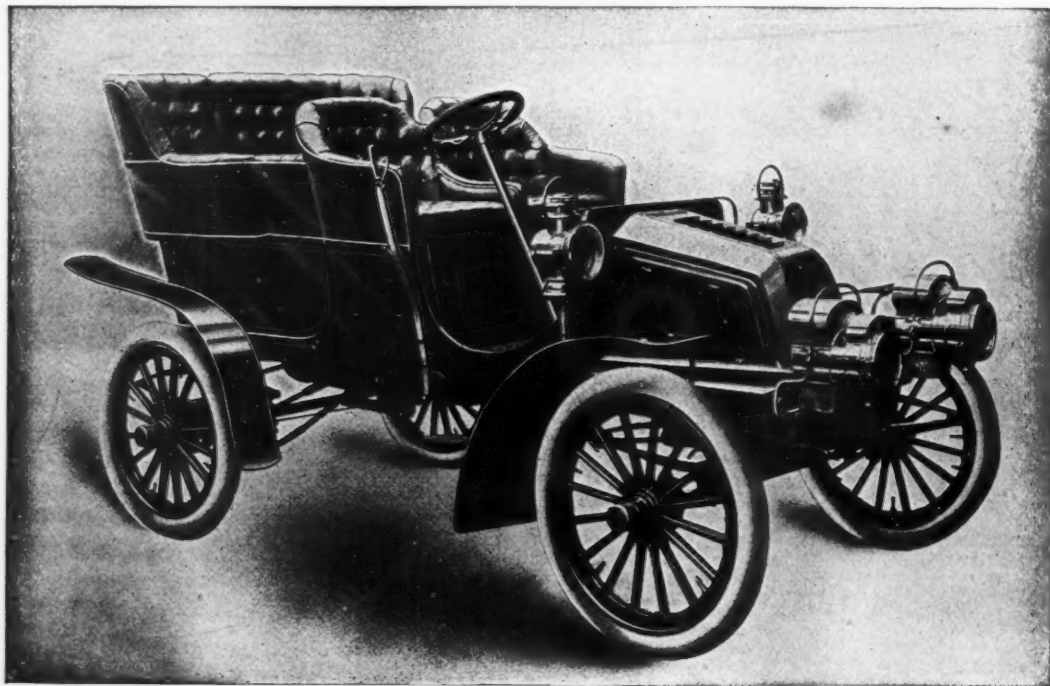
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at Pittsburg on time and without loss of efficiency points.

Both the Fredonia Tonneau No. 2 and the 9-horsepower Runabout are stayers in any kind of use.

Our run demonstrated this beyond peradventure of a doubt.

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WITH THE SPEED OF THE WIND  
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TWO CYLINDER MOTOR, Eight Horse Power and Perfectly Balanced  
MECHANICAL LUBRICATION, the Kind Usually Found on the \$5,000 Cars  
SLIDE GEAR TRANSMISSION, Three Speeds ahead; two reverse  
MULTIPLE DISC CLUTCH, Starts Without Jerk, Holds Everything in Sight

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Henry Ford, with his 999 Ford Car, on St. Clair  
Lake Course, Jan. 13th, established the official

# Worlds' Mile Record of 39 $\frac{2}{5}$ Seconds

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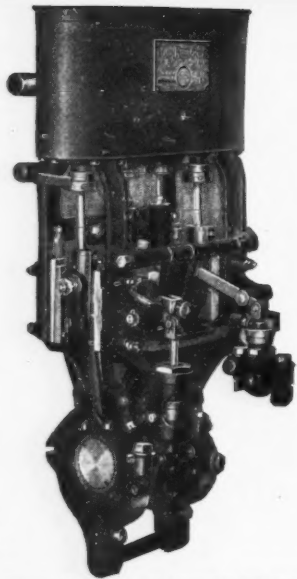
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They Combine Speed and Comfort with Perfect Safety.

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includes all of the many excellencies of the original Mason Engine, with additional features, which give it a still greater lead ahead of all other steam auto engines.

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We have made, operated and repaired more steam auto engines than any other concern, and have concentrated in the "Model C" all of the experience gained by this wide observation of all other engines.

THE "NEW MASON" Model C

We do not claim that **The Mason "Model C"** is a perfect engine, but do positively affirm, and are ready to back up our affirmation, that it is, from every standpoint,

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which you can operate with equal facility either in crowded streets or in the country...Get a Locomobile Steam Car.



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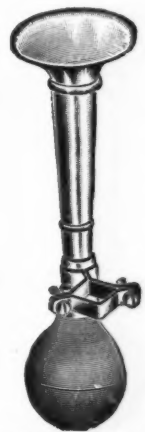
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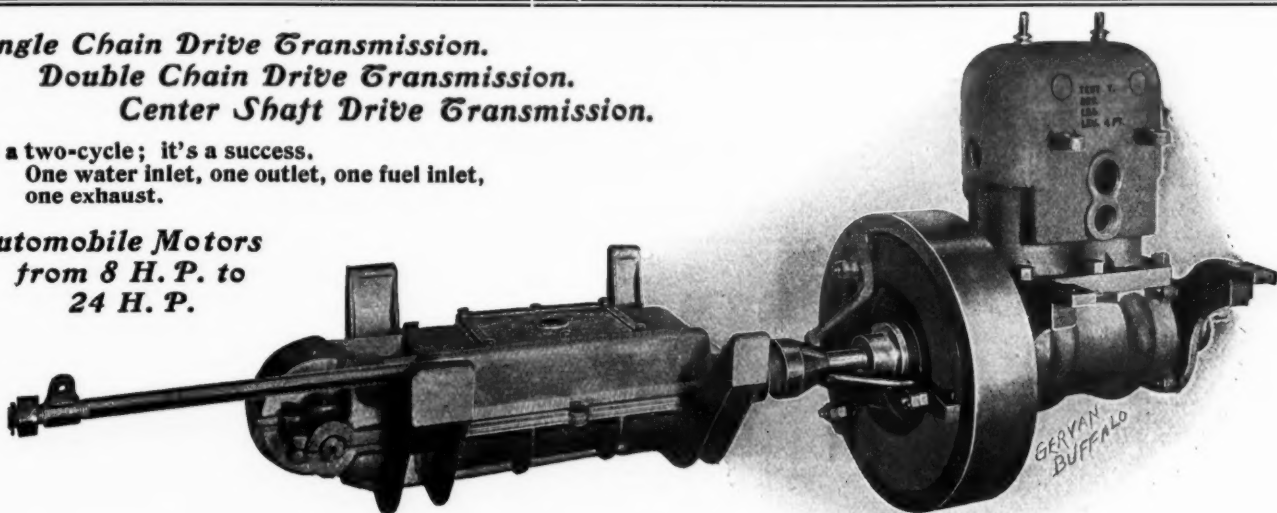
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## QUALITY in MOTORS

*Single Chain Drive Transmission.  
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Center Shaft Drive Transmission.*

It's a two-cycle; it's a success.  
One water inlet, one outlet, one fuel inlet,  
one exhaust.

*Automobile Motors  
from 8 H. P. to  
24 H. P.*



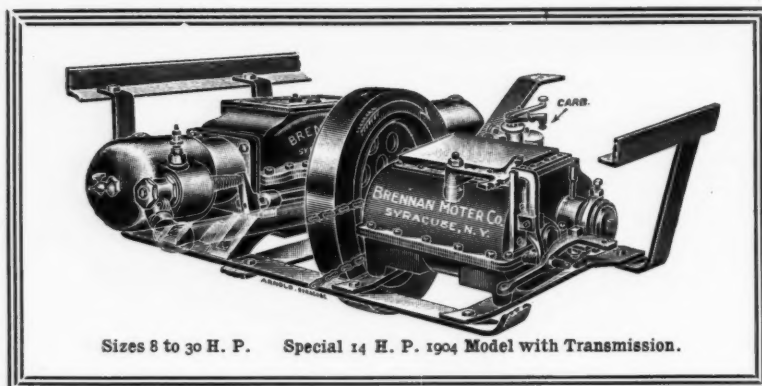
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For Prices and Points of Merit, Address  
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**"NOT THE ONLY ONE, BUT THE BEST"**  
is the verdict of a manufacturer who has tried nearly all of the  
leading motors, and finally (fortunately) adopted the

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Up-to-Date**



**Nothing  
Later**

Sizes 8 to 30 H. P. Special 14 H. P. 1904 Model with Transmission.

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WITH  
TONNEAU

**\$850.00**

Do you know the difference between a four-cycle and a two-cycle gasoline engine? You should know before you buy an automobile, for the difference is the difference between waste-power and economized energy.

The two-cycle engine used exclusively in the Elmore is the evolution of years of exhaustive experiments. The eminent English engineer, Capt. C. C. Longridge, predicted its triumph before the British Institute of Mechanical Engineers, October 16th, 1902, when he said:

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The Elmore one cylinder two-cycle engine produces as much power as the two cylinder four-cycle engine of any other type and like capacity. It will climb hills at which the four-cycle would balk; and skim at high speed through sand and mud that would stall any machine in America of equal capacity. Strong talk? We mean it to be strong! We want you to inquire and investigate. If you do—we will sell you an Elmore. We know it.

Our 1904 catalogue and a little booklet "A long jump and two short steps" contains information about automobiles that will open your eyes. Write for it.

**The Elmore Manufacturing Co.**

Dept. G.

GLYDE, OHIO

Members Association of Licensed Automobile Manufacturers.

## The STUDEBAKER AUTOMOBILE

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With Exide or Edison Battery

RUNABOUTS SURREYS DELIVERY WAGONS  
STANHOPES VICTORIAS AND TRUCKS

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TOURING CAR—Light and Powerful

**"The Automobile with a Reputation Behind It"**

Write for Catalogue to

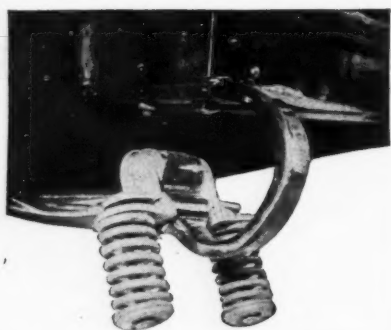
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Automobile  
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Oakland, Cal., 27th Oct., 1903.

The Graham Co.,  
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Dear Sirs: I notice your "ad" of the GRAHAM Supplementary Spiral Springs, and as I am tired of paying for broken leaf springs for my touring car I will try your springs which you will ship to me by Wells-Fargo, C.O.D., with full instructions to apply the same.

Yours truly,

This is the regular thing by every mail.

**WOULD I?**

**THE GRAHAM CO.**

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## STEVENS-DURYEA WINS!

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The noted machine that

*Starts from the  
Seat*

defeated every car competing in its class, and won each of the three events entered. Price at factory, including complete equipment, \$1,300.

Send for beautifully illustrated catalog; mailed free on request.

**J. STEVENS ARMS & TOOL CO.**

705 Main Street,

**CHICOPEE FALLS, MASS.**

Member Association Licensed Automobile Manufacturers.



## The Akron Clincher Tire

can be put on your car with the perfect assurance that it will stand the most vigorous wear that you can give it.

The Flat Tread Corrugated Akron Clincher Tire is proof against side-slipping. Made with elliptical tread if preferred.

Fits the Standard Clincher Rim.

Although it's scarcely ever needed, we give with each set of our Clincher Tires, a Repair Kit worth \$2.50 and a strong Pump.

Write for book describing all our tires, and free booklet, "How to Repair Tires"



**TIRE & RUBBER CO.**

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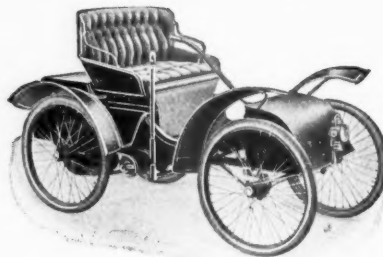
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## Are You Looking for an Automobile Bargain?

IF SO, CONSIDER WHAT WE OFFER YOU FOR  
**ONLY \$450.00**

## THE MICHIGAN RUNABOUT

Light  
Strong  
Durable  
Fleet



Hand-  
some  
Well  
Built

This is a car capable of carrying two adults over all ordinary roads at a good rate of speed. It is what the busy man needs—what the man of ordinary means can buy. Air cooled motor, runs summer and winter. Built throughout of best materials and with greatest care to details. Cannot be duplicated for the price by anything on the market today.

[Send for 1904 Catalog and Statements of Users.]  
Prompt Delivery.

**MICHIGAN AUTOMOBILE CO., LTD.,**  
KALAMAZOO, MICHIGAN, U. S. A.



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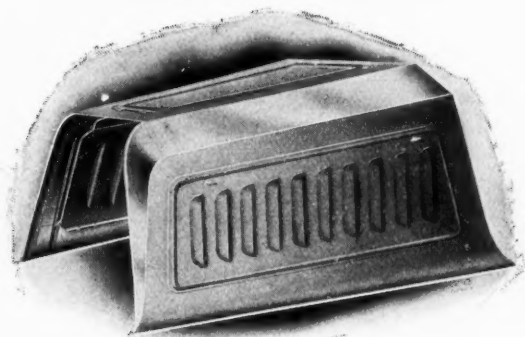
WATER-JACKETED CYLINDERS A SPECIALTY

"LIKE THE FRENCHMEN MAKE."

THE MANUFACTURERS FOUNDRY CO.

WATERBURY, CONNECTICUT.

**"Keep Us In Mind"**



Metal Bodies  
Hoods  
Fenders  
Radiators  
Metal Tonneaus  
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**Our Hood Department**

is the

**"Biggest Ever"**

We Make What You Want and

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A nicely made hood adds very much to the appearance of an auto. Don't buy *cheap* hoods as they make your autos look *cheap*. Let us talk with you for 1904. You will regret it if you wait too long. **First Come, First Served.** Several have already specified.

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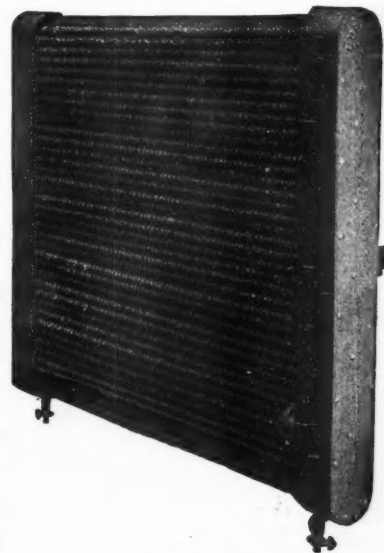
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Part of our ideal flash steam generating equipment for the coming season.

Sold separately when wanted.

Write for our new catalogue, which will be out January 1st.



Burnell Condenser.  
Takes Care 100 per cent of Steam

We will Show at New York and Chicago



1904 "Burnell" Kerosene Burner

Our new "Burnell" Condenser condenses 100 per cent of the steam.

Give us a call at the Shows. We will explain how we do it.

**The BARTON BOILER COMPANY,** SOLE MANUFACTURERS,

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4212-4230 State St., Chicago,

PHONES OAKLAND 1540-1

U. S. A.

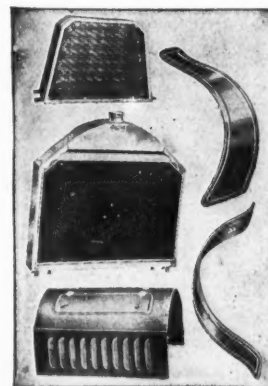
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## New Catalog of Radiators, Hoods, Etc.

This catalog contains much instructive matter for both expert and layman. Handsome illustrations of the types of radiators, hoods, fenders, etc., that will prove most popular this season in both foreign and the highest class of American cars. We supplied over 7-10ths of the machines built in 1903 and are in line for even a larger proportion for 1904. Send for Catalog A. C.

**OUR EXHIBIT WILL BE IN BOOTH 159, NEW YORK 210, CHICAGO 32, DETROIT .. SHOW**

**BRISCOE MFG. CO., Detroit, Mich.**





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## The Hill Automatic Starter

Can be attached to any Gasoline Car.

The operator mounts the car, pulls a small valve lever, throws in the clutch, and the car moves off.

Write us what car you use, and we will tell you all about it. Call on us at our space, 186 North Balcony, Chicago Automobile Show, and see it work.

**THE STEEL BALL COMPANY**  
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THE NEW WAY

## Absolute Perfection in Searchlights and Generators.

THE LAMP MAKER IS DOWN AND OUT.

LAMPS are all right simply as signals, but for fast running in the dark the **Rushmore Lens Mirror Searchlight** is a necessity. Our six-inch Lens Mirror Searchlight costing but \$19.00 with the new automatic "Dry Dust" Generator at \$15.00, total \$34.00, will give more light and show ten times as far as \$100.00 worth (we mean cost) of reflector lamps. We make also 7-inch, 8-inch and 1-inch sizes and large generators for the big cars.

For ten years the Rushmore Electric Projectors have been the standard in the Navies of the world.



6-INCH SWING LIGHT FOR OLDS AND OTHER CARS.

**\$24.00**

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**RUSHMORE DYNAMO WORKS, Plainfield, N. J.**  
AGENTS IN PRINCIPAL CITIES.

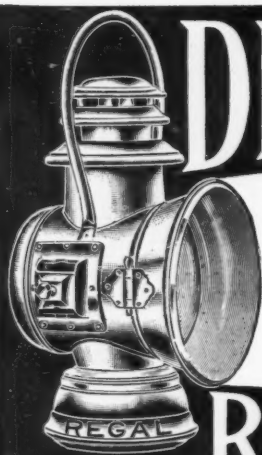
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YOU WANT THE BEST, OR ORIGINAL, OF COURSE

Electrical apparatus for Automobiles carried in stock.  
A Catalogue for the Asking.

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# DIETZ AUTOMOBILE LAMPS

YOU WILL SEE

# DIETZ LAMPS

OR AN IMITATION OF THEM ON EVERY STEAM OR GASOLINE AUTOMOBILE.

**WHY?**

Because both makers and users of lamps saw that we had the only practical way of making **GOOD OIL LAMPS**. You will be sure of satisfaction if you insist on

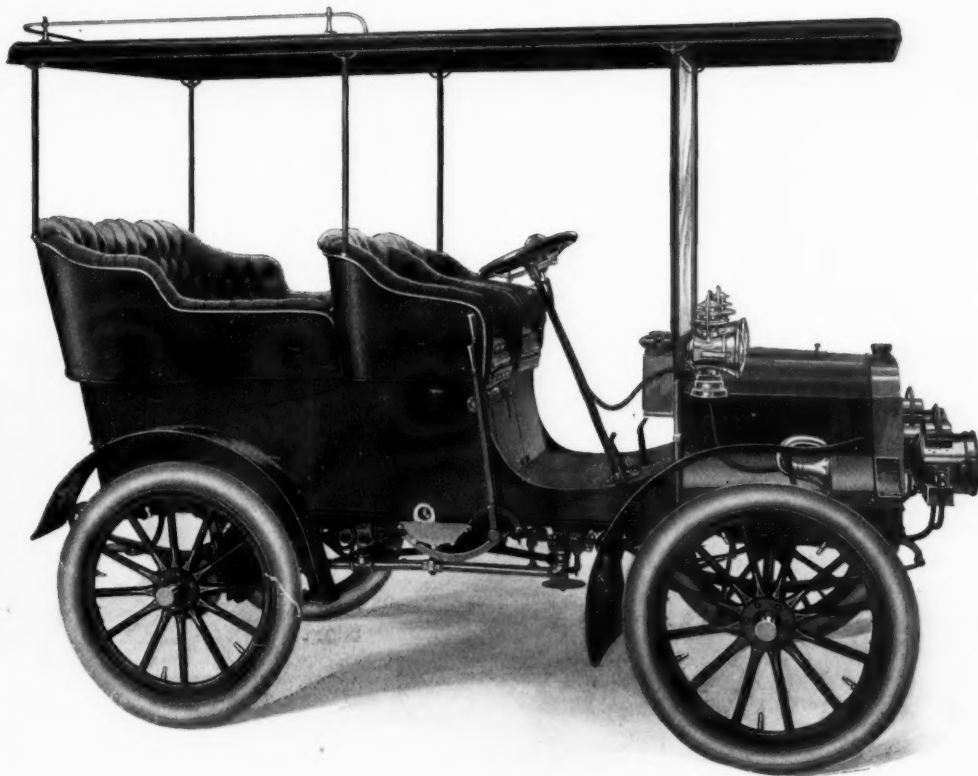
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Stamped with the Name.

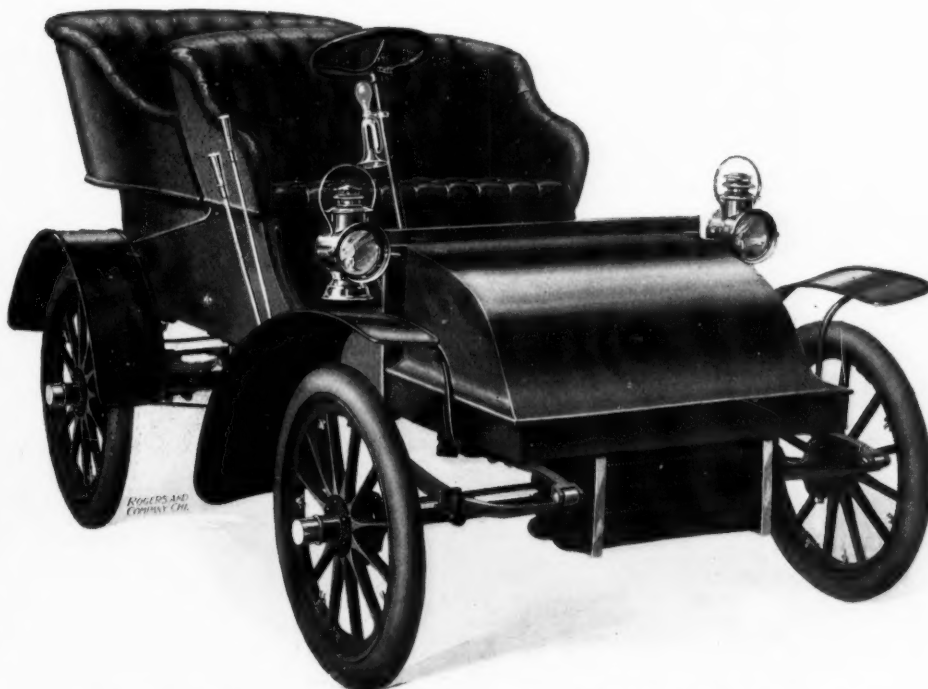
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# The Model High Power Touring Cars



Five Passenger Touring Car. Weight, 1600 lbs.; 16 actual H. P.; Speed, 40 miles per hour if desired.



Four Passenger Touring Car. Weight, 1200 lbs.; 12 actual H. P.; Speed, 30 to 35 miles per hour.

## SOME OF THE REASONS WHY YOU SHOULD SEE THE MODEL TOURING CAR BEFORE BUYING:

- 1st. Considering weight and transmission they have the greatest amount of power placed in any car.
- 2d. They have double opposed cylinder engines of our own manufacture, with adjustable bearings throughout, without a single packing joint, and so arranged that every point can be reached without tearing the balance of the machine apart.
- 3d. The only cars built in which a five-speed transmission is placed, and this advantage with the high power enables them to go where others can not follow.
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- 7th. Hub brakes and every other advantage to be found on high-class cars.
- 8th. Finish and construction throughout first-class in every respect.



Spaces  
at the  
Chicago  
Automobile  
Show  
144 and 145

## MODEL GAS ENGINE COMPANY

Auburn, Ind., and Los Angeles, Cal.

# TRIUMPH OF THE Michelin Tires

THE FAMOUS MICHELIN TIRES ARE EX-  
HIBITED ON AMERICAN AND FOREIGN  
MACHINES ALL OVER THE NEW  
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JUST RECEIVED



ANY SIZE READY FOR

Immediate Delivery

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NORRIS N. MASON, Pres.

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There are

**NO SINS of  
OMISSION**

in the  
construction  
of



# The Morgan & Wright Clincher

Every feature of the tire's construction—whether it concerns its resiliency, toughness, strength, proper treatment of fabric layers, correct fit to rim, or the combining of all these so as to give the greatest durability with the least amount of trouble—every feature has been made **STRONG IN ITSELF**, with the result that there are no weak points to impair its serviceability. :: ::

A word to  
the wise:

**"INVESTIGATE"**



Send postal request for  
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**Morgan & Wright**

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NEW YORK. DAYTON, O. ST. LOUIS. SAN FRANCISCO.

Chicago Automobile Show, Space 187

IN THE LEAD, AS USUAL



# DIAMOND TIRES ALWAYS LEAD

AT the New York Show not only are DIAMOND 1904 TIRES the equipment on more cars than any other make of tire, but they are the equipment on **15 per cent more cars than their next nearest competitor.** It merely goes to show once more that the majority of MANUFACTURERS CONSIDER THE DIAMOND TIRES POSITIVELY UNEQUALED. Moreover, every public test has proved this, ISN'T THE MORAL OBVIOUS?.....

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AKRON, OHIO.

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**\$650.**

TONNEAU. \$100 EXTRA

Finest Workmanship and Material Obtainable...A  
Wonderful Hill Climber...The Acme of Simplicity.

...THE...

# ...CAMERON



**POWERFUL  
AND FAST!**

...CAR... FOR  
1904.

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Manufactured by **JAMES BROWN MACHINE CO.**

**United Motor Corporation,** SELLING AGENTS  
PAWTUCKET, R.I.

Air Cooled Vertical Motor...Shaft Drive...Sliding Gear  
Transmission...Dust Proof...Perfect Oiling System.

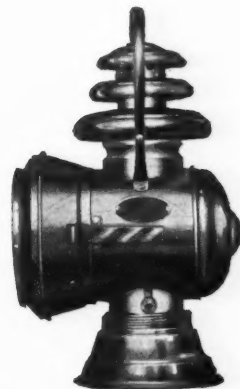


No better example of fine American workmanship, of carefully studied out principles, of extreme care in construction, can be found than in



Phare Solar. Price \$25 each

# SOLAR LAMPS



Triple-top Oil Side Lamp.  
Price \$20.00 Pair.

They are made to give absolutely satisfactory service under most adverse conditions. If you have used them in years past, you know—if not, be convinced this year.

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100 rooms with hot and cold water,  
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FIRST-CLASS CAFE AT POPULAR PRICES

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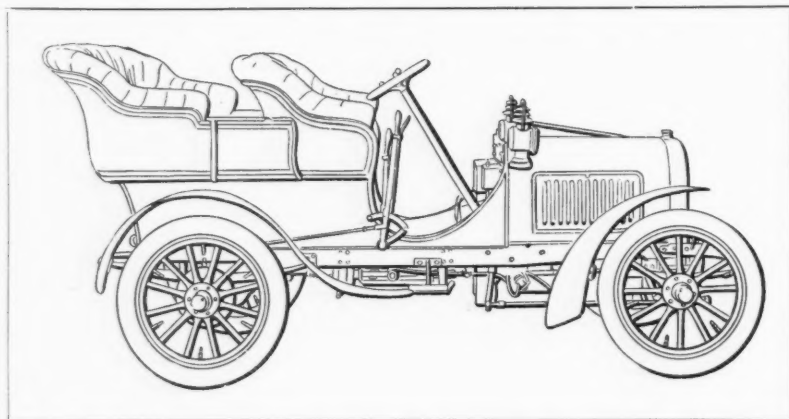
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For Chicago Automobile Show

February 6-13....One Block from the Coliseum

# The Walter Car

COMBINING STRENGTH...GREAT POWER...ELEGANCE



**Four Cylinders  
30 h.p. :: \$4000**

Mechanically operated valves, independent cylinders, imported pressed steel frame; King Leopold tonneau, seating five persons. Machine driven by a large bevel gear with special patented universal joint with spiral spring to transmit power to start car, thus obtaining easy motion and abso-

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ONLY MAKER OF FINE

## Automobile Clothing Exclusively

IN AMERICA FOR BOTH SEXES

MATERIALS—All Waterproof.

SILK  
WOOL  
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GLACE  
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MAKE FOR.

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NEGLIGEE  
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FIT.

By a Designer worthy of the name who will make appointments for consultation or answer mail communications.

Only high-class trade wanted.

BUSINESS SUITS,	\$35.00
OVERCOATS,	35.00
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All Materials  
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Coachmen's and Chauffeurs' Outfits a Specialty.

Correspondence Solicited.  
Discount to the trade.

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from 10 to 100 h. p., and from 25 to 65 feet in length.

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NEW YORK

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1904

16 H.P. TOURING CAR

Nothing we can say of the 1904 Yale will convey an adequate idea of its manifold excellencies. It calls to you for earnest investigation and if you heed the call, we are satisfied you will pronounce it as we do the most perfect car at the price made in America.

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Members Association Licensed Automobile Manufacturers

“ACAR WITH THE DOUBT AND THE JAR LEFT OUT”

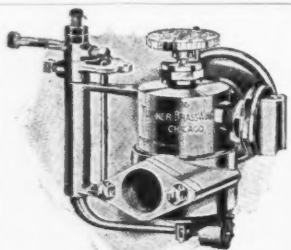
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EXCEL ALL OTHERS

...WE CAN PROVE IT BY INDISPUTABLE FACTS...



Patented Dec. 15, 1903.

Our No. 9 Booklet describes our 1904 Carbureters and includes valuable information concerning the principles of construction. Sent free on request.

**The Turner Brass Works**  
59 Michigan St., Chicago.

Or BRANDENBURG BROS. & ALLIGER, New York and Chicago.

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## SALISBURY IMPROVED ARTILLERY WHEELS



On your 1904 cars. **Advantages:** No Shearing of bolts, spokes in perfect alignment, absolutely torsion proof. Stock patterns for standard cars, or we make them for special designs.

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Rates \$1.50 and Upward

Facing Lake Michigan

200 Rooms...125 Bath Rooms

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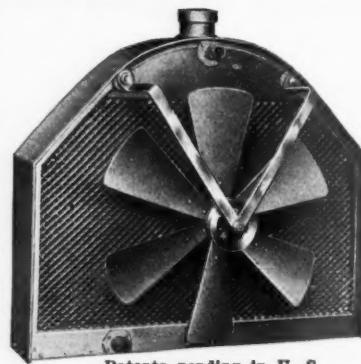
MICHIGAN AND JACKSON BOULEVARDS....CHICAGO, ILL.

Everything New

Handsomest Dutch Room in America...Cuisine the Best....Auto Headquarters.

## Whitlock Cellular Coolers

Are the Standard.  
Made in All Sizes.



Before placing contracts for 1904 do not fail to inquire what kind of a record the Whitlock Cellular Cooler has made during the past summer.

We also make a specialty of High Grade Disc Radiators.

**The Whitlock Coil Pipe Co.**

HARTFORD, CONN.

Patents pending in U. S.  
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## CHAMPION TRANSMISSION GEAR

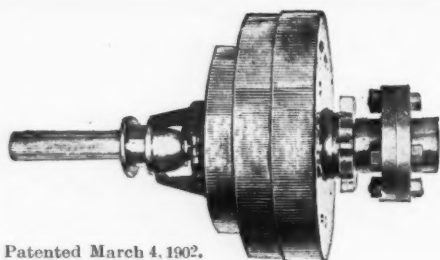
TRIED. PROVEN.

Carefully designed. Accurately made. For sizes and prices and other information write

**CHAMPION MANUFACTURING CO.**

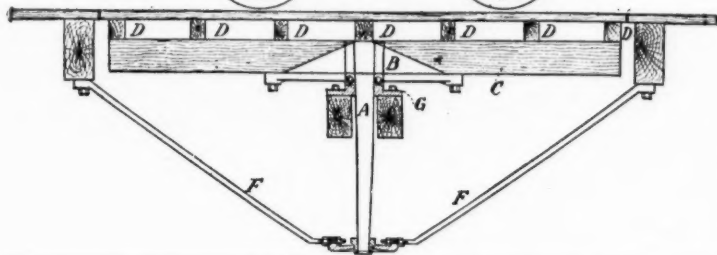
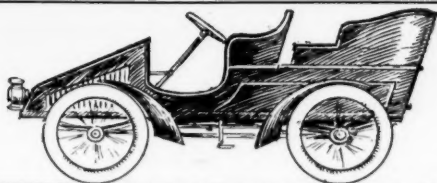
9-11 Alling Street,

NEWARK, N. J.



Patented March 4, 1902.





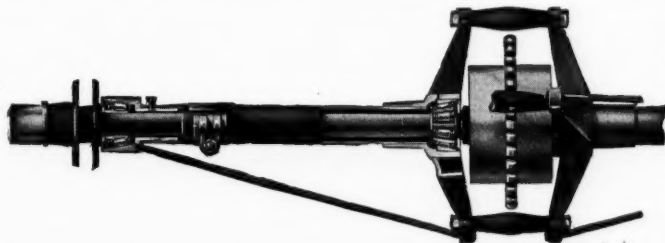
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Noiseless and Frictionless  
Three Sizes—10, 11 and 12 Feet Diameter  
Carries 3,000 Lbs.

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One of these Turn Tables can be seen at the  
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Steering Knuckles

Rear Axles

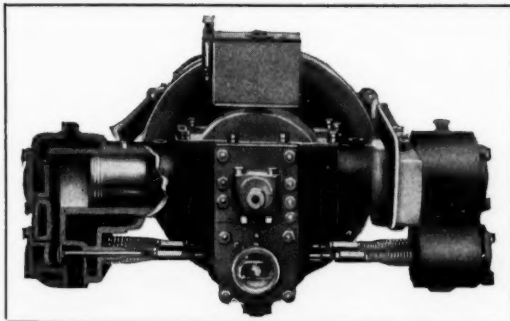
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Only Roller Bearing capable of taking up all wear.  
Warranted for two years.

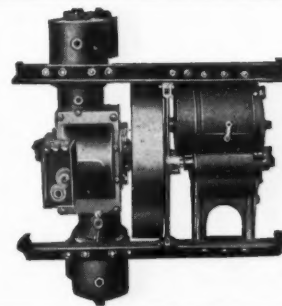
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### INTERESTING FEATURES:

Double opposed cylinder. Every bearing of brass or roller. Every bearing adjustable. No replacing of bushings. Steel forged connecting rods and crank shaft. No cylinder heads of packing joints communicating with water space. Extremely large water jacket surrounding valves as well as cylinder. Unusually large valves with small lift. Valves to each cylinder operated with same cam. Pistons, connecting rods and other parts can be removed without interfering with other parts of the engine. All working parts in both engine and transmission in oil tight case. Force feed lubrication. Five-speed transmission. Steel and brass gears with aluminum case. Weight of 12 H. P. engine and transmission complete, 325 pounds. Weight of 16 H. P. engine and transmission complete, 375 pounds. Power considered, lightest engine and transmission on the market.



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## O. K. TRANSMISSIONS AND RUNNING GEARS ARE O. K.

Write  
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DEPOTS FOR THE PROMPT DELIVERY  
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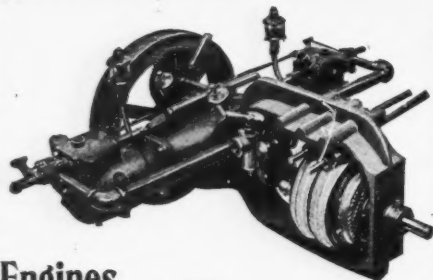
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SALES OFFICES:  
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**THE ELECTRIC STORAGE BATTERY CO. Philadelphia**

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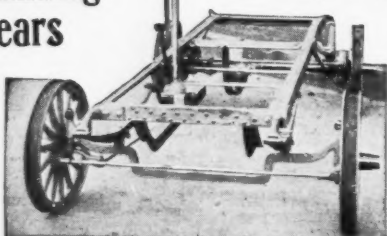
Let Us Quote You Prices on These Goods.

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are our specialties though we manufacture many other automobile parts. Our new catalogue free on application.



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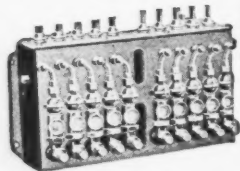


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Carried in stock and made to your order. Close quotations in quantities.

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521-525 Larrabee St., - CHICAGO.  
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Obtains Ideal Results. Manufacturers Send for Estimates.

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McCORD & CO., Lessees,  
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## GEO. COOPER & CO.

CLEVELAND, OHIO

## AUTOMOBILE SPRINGS

Oil Tempered and Hand Fitted

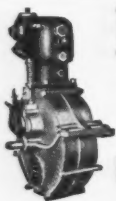
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Ideal Gasoline Car for City and Country Use. Write for 1903 Catalog and Prices.

**The Automotor Company**  
SPRINGFIELD, MASS.

**The P. J. DASEY CO.**  
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We furnish everything necessary to build an automobile including motors 5 to 20 H. P. Send stamp for our catalogue of supplies.



## Evirude Motors

with 3 speeds and reverse, new type planetary gear. 7 H. P. single, 14 H. P. double cylinder. Finest workmanship and finish.

Prompt Deliveries, Prices Right.

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I design engines or complete vehicles and can build your first machine if you wish. Tests made anywhere.

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LAMPS ARE THE BEST

ATWOOD MFG. CO., Makers  
Send for Catalogue. Amesbury, Mass.

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WATER WON'T FREEZE

Non-corrosive. Fluid at zero. Will not crystallize or evaporate. Five gallons in wood-jacketed can, \$1.50.

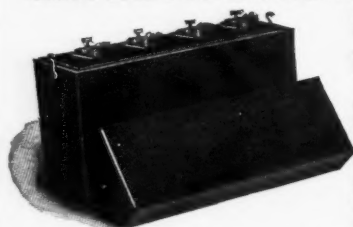
**AUTO ACCESSORIES CO.**  
501 Citizens Bldg., Box 153, Cleveland, Ohio



**THE SIMPLEX MULTIPLEX SYSTEM**  
OF CORRECT LUBRICATION  
**THE AUTOMATIC LUBRICATOR COMPANY**

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## Broken Down Coils Have Given You Trouble.



After trying the rest, try the

## BEST

We make all types and all sizes. Never had a coil break down. Our literature on jump spark ignition is interesting. Yours for the asking.

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## ALUMINUM

Aluminum  
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Parts a Specialty

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hesitate in getting a coil when the DOW COIL is acknowledged to be the best coil in the market and is used on all the best machines?

Over 300 Styles to select from.

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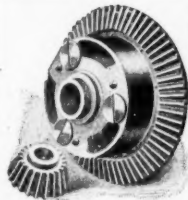
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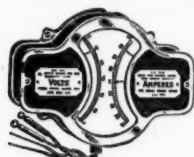
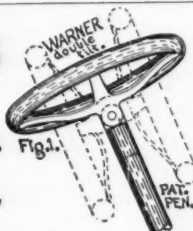
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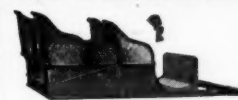


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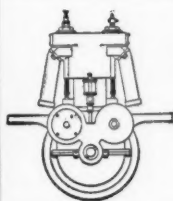


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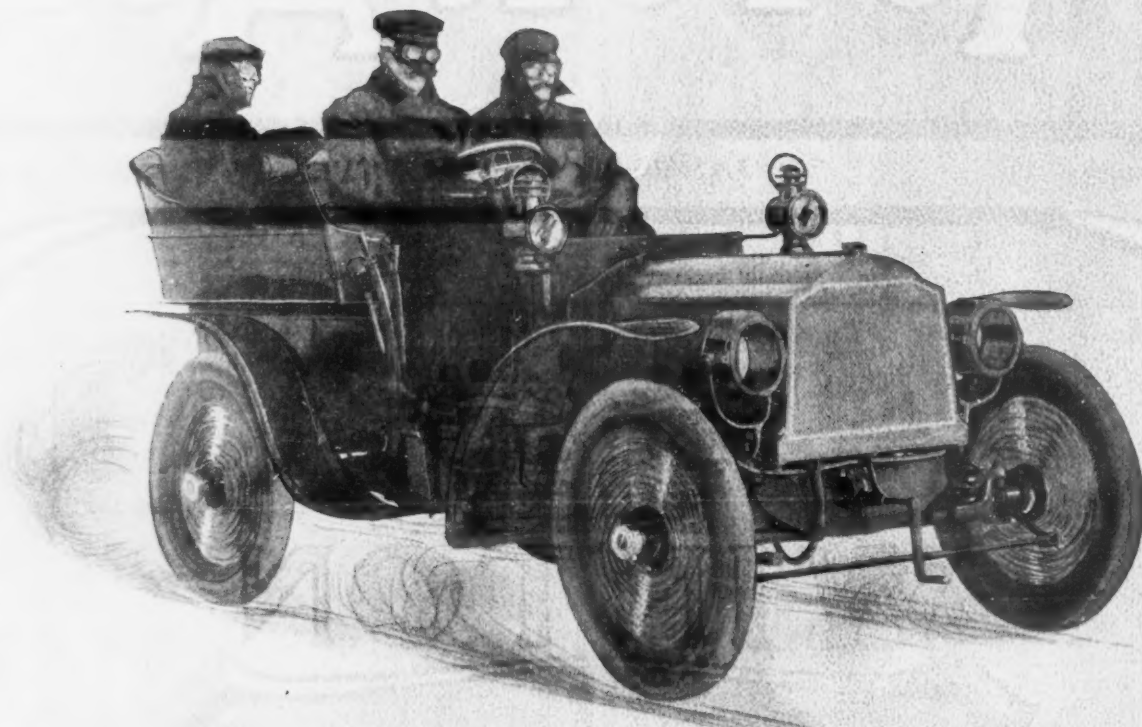
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